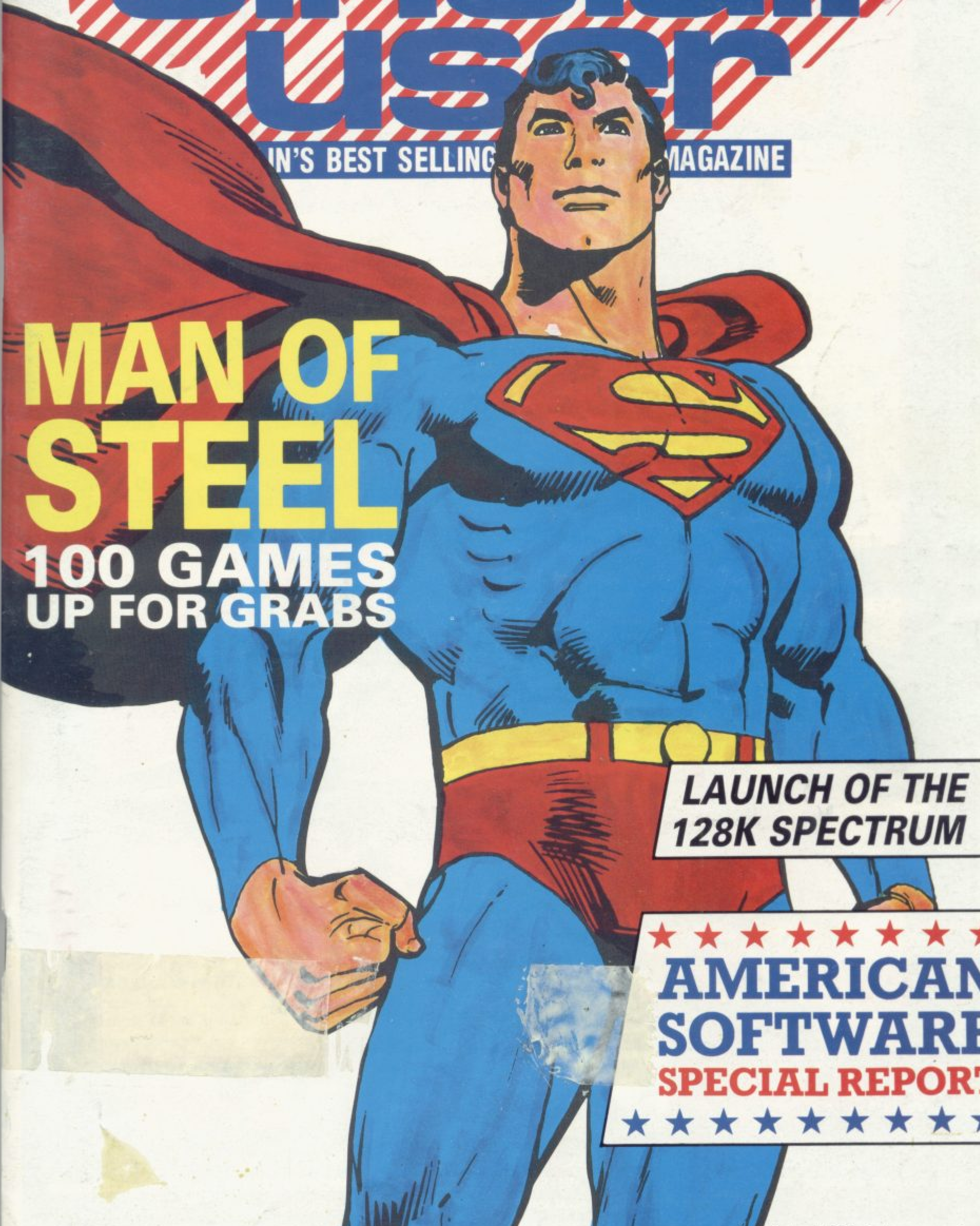
November 1985 No. 44

95p

Mark McGinn

sinclair user

IN'S BEST SELLING MAGAZINE



MAN OF STEEL

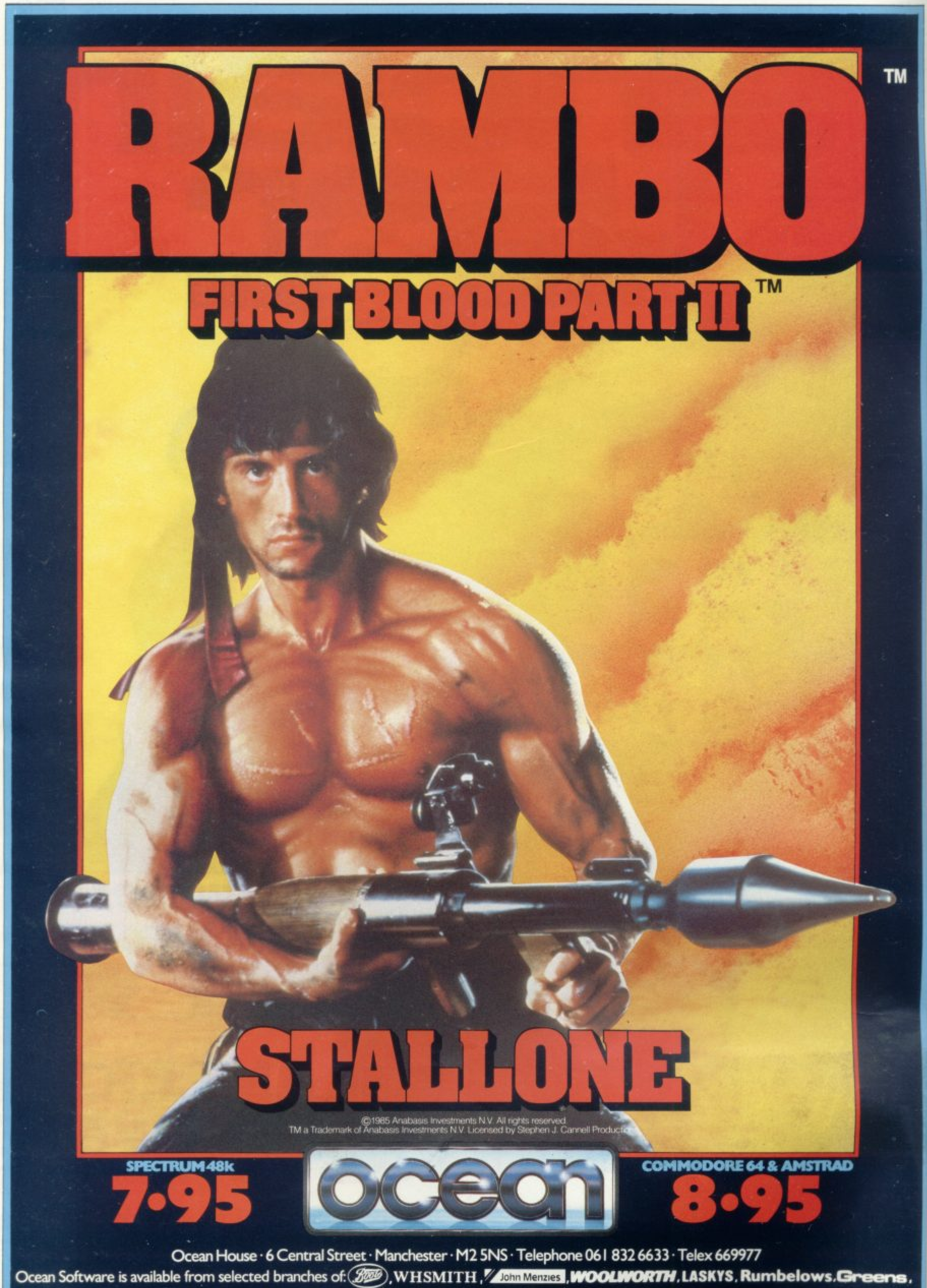
100 GAMES UP FOR GRABS

LAUNCH OF THE 128K SPECTRUM

★ ★ ★ ★ ★ ★ ★ ★

AMERICAN SOFTWARE SPECIAL REPORT

★ ★ ★ ★ ★ ★ ★ ★ ★



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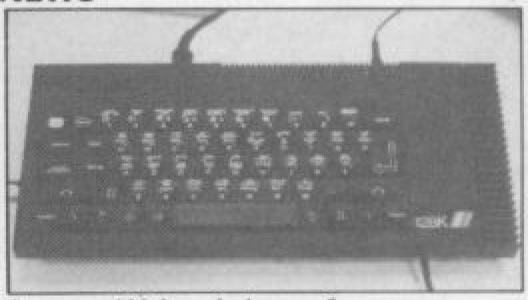
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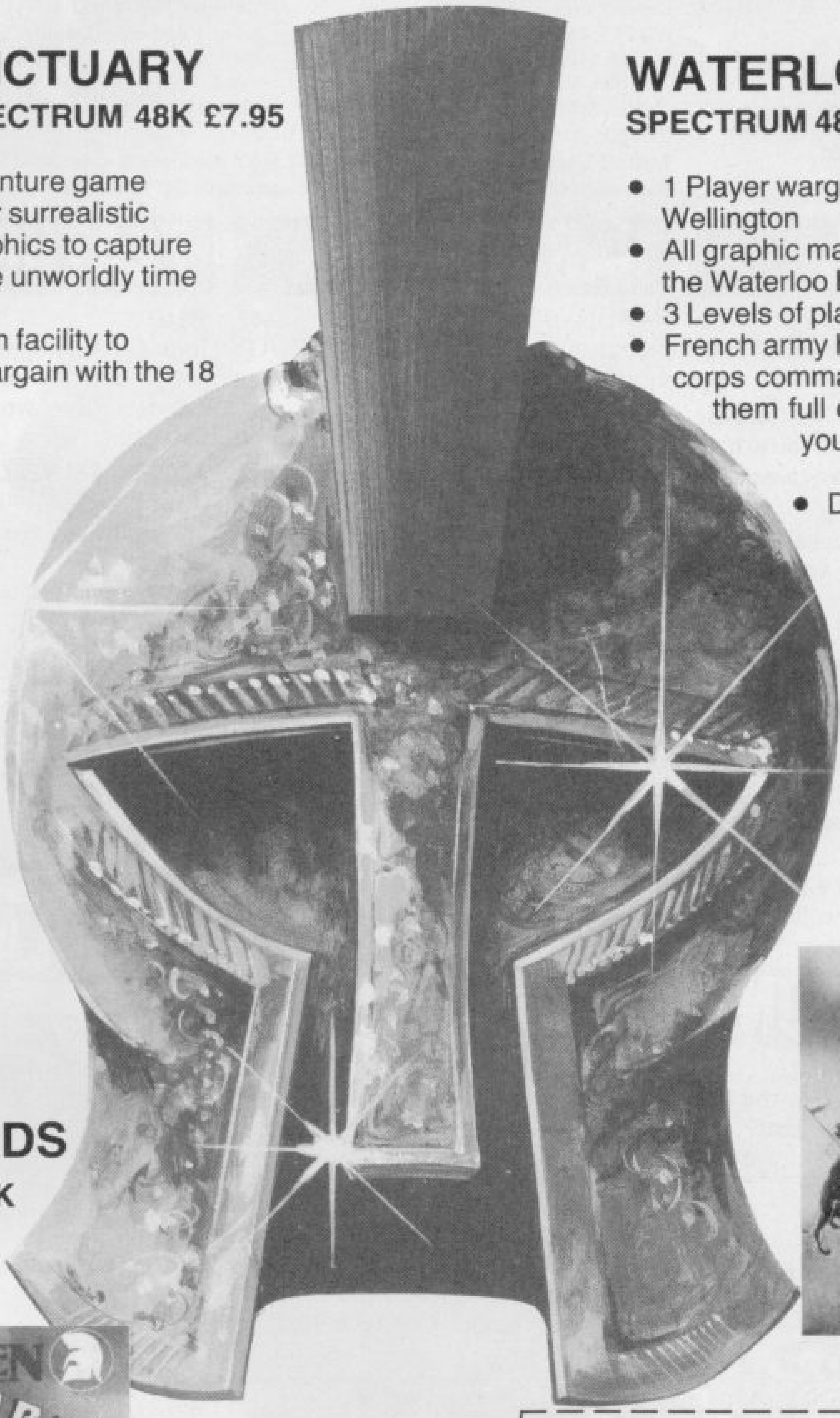
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If you would like to contribute to *Sinclair User* please send programs or articles to:
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Original programs should be on cassette and articles should be typed. We cannot undertake to return them unless a stamped-addressed envelope is included.
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- Fast, full colour surrealistic landscape graphics to capture the mood of the unworldly time sanctuary
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- locate the 6 crystals to power your time machine
- Make enough money by trading with the natives to buy the crystals
- Find the time machine before your presence in the sanctuary becomes unstable.

WATERLOO

SPECTRUM 48K £9.95

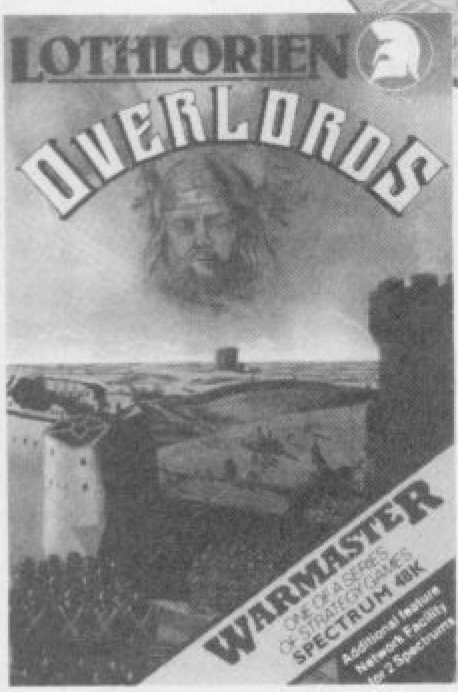
- 1 Player wargame against Wellington
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- French army has "intelligent" corps commanders — you can give them full command of a corps or you can give corps or unit orders
- Detailed Booklet
- Full details of terrain feature and realistic strongpoints

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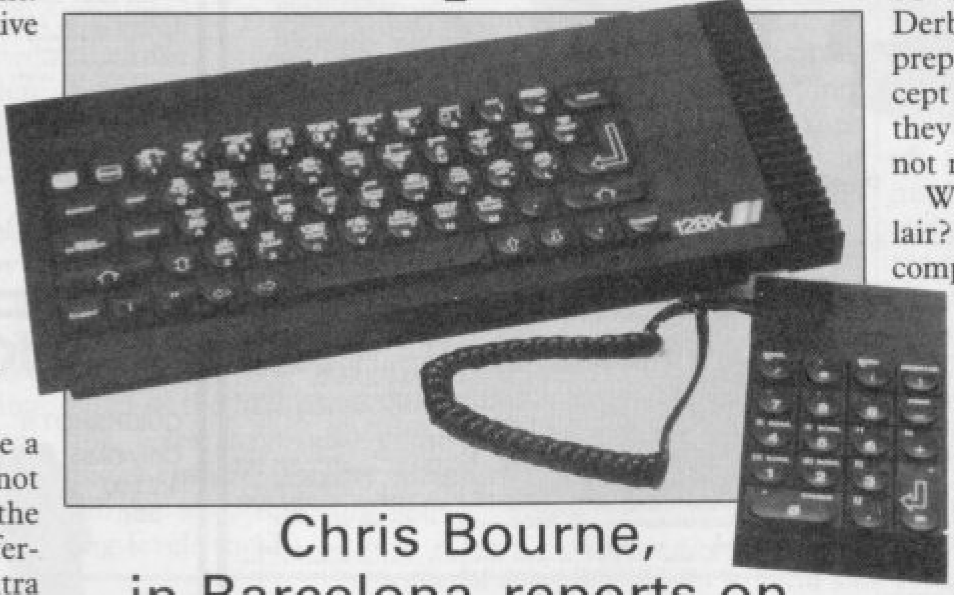
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Launch of the Spectrum 128 in Spain

Chris Bourne, in Barcelona, reports on Sinclair's new computer



THE 128K Spectrum, code name Derby, has finally been launched. You will have to wait a while to see it in the UK, though, because Sinclair Research, after denying the existence of the machine for ages, chose to launch the beast in Barcelona, at the Sonimag Fair at the end of September.

Essentially, the machine is two computers squeezed into a single box. On power-up, you choose which mode you want to use — the 128K version is implemented automatically, but if you type SPECTRUM in capital letters then the machine reconfigures itself to give you a 48K Spectrum Plus — completely compatible, so it is claimed, with all existing Spectrum software.

The 128K is being manufactured in Madrid by Investronica, Sinclair's agent. According to a representative of Investronica, that is all to do with Spanish tax laws concerning foreign imports. It will sell in Spain for about £220; given the general difference between Spanish and UK prices, a UK model should go for roughly £170.

The 128 looks very like a Spectrum Plus. That's not surprising — it's got the same case. Obvious differences are a variety of extra sockets, a big heat sink bolted onto the righthand side, and a separate keypad attached to the machine by a springy cable. It is all powered by the same transformer as the Spectrum — but it does an awful lot more.

The keypad works only in 128K mode. It acts as a calculator, so you can perform arithmetical operations with the results printed on the screen without disturbing the program you are writing. It also incorporates a set of editing commands. Those allow you to move a cursor around the screen and swiftly delete or edit errors in your program. It plugs into the front of the Spectrum via a telephone-style jack plug. It is simple to use, and an excellent idea for taking the sweat out of programming in Basic.

A full range of ports has been included on the machine. There is an RS232 socket, which can be linked directly to a printer. For the show, Investronica hooked it up to a synthesizer via a MIDI interface and blasted one of the Bach Brandenburg concertos at us — very impressive, for Sinclair sound. Also included is a reset switch, an RGB socket for monitors, a television aerial socket, the usual holes for tape leads and the standard wide port for other peripherals.

The sound chip is also completely new, giving three voices and channelling the sound through the television speaker. If in 48K mode, the old BEEP command is automatically interpreted for the new chip. In 128K mode a new form of command is used. Data for the music is stored in strings in the form of a letter for pitch and a number for duration of the note.

Other changes to the Basic in 128K mode include the abolition of the keyword system — commands are entered one letter at a time. You can, however, switch down to 48K mode halfway through writing a program, but you cannot switch up. The 128 also has the capacity to act as a RAM disc. That's a facility whereby areas of the RAM can be set aside to store a suite of programs, or sets of data, in much the same way as on microdrives or disc drives. Access to files on RAM disc is, naturally, almost instantaneous. We were unable to examine the full set of commands which go with the facility, but as an example CAT! produces an instant catalogue of RAM files.

Sinclair Research won't comment on the new machine beyond admitting the existence of the Barcelona launch, but the Spanish press releases say a UK launch is planned for next spring.

One possible explanation for the Spanish launch would be some sort of no competition deal signed with UK retailers in order to unload QLs and Spectrums. Investronica says that is Sinclair's problem and is clearly delighted to be launching the product.

Without having a machine to study in detail, we can't assess the reliability of the 128K. But one of the machines on show had a set of notes written on the base which appeared to list modifications to that unit, and we did see what looked like a spectacular crash occurring with another. It would be unfair to criticize the Derby on the basis of such preproduction models, except to note the fact that they were not for sale and not running perfectly.

Will the 128K save Sinclair? Since it is completely compatible with all 48K software there's no reason why the public should prefer the smaller machine to its big brother except on grounds of cost. It looks very posh with its keypad and coiled cables attached.

Charles Cotton, director of sales and marketing at Sinclair Research, says, "The impetus to introduce a Spectrum 128 in Spain comes from the peculiar market forces operating there. It is a very important market for us, as we account for over half of the home computers sold in Spain."

He doesn't deny the possible introduction of a UK version in the spring, but adds: "We're confident we have the products the public wants this Christmas, at the right price. A Spectrum 128 doesn't fit into the UK picture just now."

more news on page 7

Christmas bargains

THE RUN UP to Christmas has started. Special offers are appearing in the shops and prices are being slashed to increase sales.

The Alphacom 32 from Dean Electronics is one example. The new price is £29.95 — a drop from £59.99. "We are hoping to stimulate volume sales," says Sean Tredinnick. That offer will continue while stocks last.

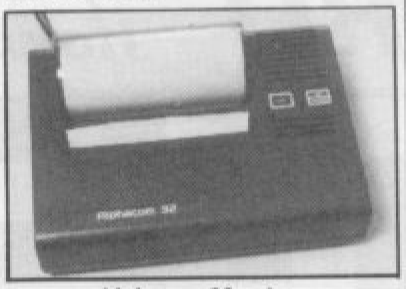
The large number and variety of Spectrum pack deals may also be a contributing factor to the Alphacom's price drop. It might seem pointless to buy a Spectrum and several peripherals for around the £130 mark and an Alphacom printer for almost £60.00.

Boots is offering at £139.95 a Spectrum Plus, autofire joystick and joystick interface, a data recorder and six pieces of software.

Terry Blood, the distributors, has put together a package which consists of a Spectrum Plus, data recorder, Quickshot I joystick and interface, four US Gold games and 14 days free accommodation for two in a three star hotel in the UK, subject to certain conditions. The cost will be between £140 and £150.

The Spectrum Group has a slightly more expensive package costing £149.95 which includes a Spectrum Plus, data recorder, Currah Speech Synthesiser, Quickshot II joystick and a Stack Light Rifle. Another package from the same group costs £109.95 and includes a Spectrum 48K, data recorder, Quickshot II joystick and interface and three pieces of software.

Dixons has two packages. The first at £139.99 includes a Spectrum Plus, data recorder, Quickshot II joystick and Kempston compatible interface and 10 pieces of software. The second at £199.99 includes a Spectrum Plus, ZX printer and a Sinclair flat screen TV. Dixons is also selling the QL at £199.99 with five games on microdrive.



Alphacom 32 printer

Sinclair: all shook up

FOLLOWING THE recent shake up at Sinclair and a creditors' meeting held in early September, a number of changes have been announced — perhaps the most serious being those at board level.

The changes instigated by Bill Jeffrey, the company's chief executive appointed in July, has seen a reduction in the board from 14 to five directors. Those remaining are Sir Clive as non-executive director; Bill Jeffrey; John Lee, finance director; Bill Matthews, corporate services director and company secretary; and Kenneth Dicks, non-executive, who is also a director of N M Rothschild & Sons.

The reduction in board levels is due to a review carried out by Bill Jeffrey to 'improve operational efficiency'. At present there is no answer to the question of why the review was instigated in the first place. Staffing levels have also come under review. Twenty jobs will be lost, reducing staffing levels to 120.

QL software on the upsurge

SOFTWARE houses begin to stir themselves from the Spectrum swamp and look at the possibilities of the QL, spurred on by the £200 price cut. Firebird, the BT offshoot, has already released **QL Booty**.

The game, set on a pirate ship, was a tremendous success on the Spectrum in Firebird's budget range. Essentially a jump'n'dodge production, it involves searching through the holds of the ship and collecting bags of treasure. Although it's not exactly original, at £9.95 it represents excellent value for money, especially as it includes another game, **Grin Wars**.

Other companies appear to be gearing up to follow suit. Adventure International, which produces conversions of the original Scott Adams games is already converting its adventure development system to the QL.

Ocean has also expressed an interest in the QL. "A programmer approached us at the recent PCW show," says Ocean's Paul Finnegan. "We gave him a selection of our games to look at, and we hope to be releasing a conversion soon".

While companies such as Ocean are cautious about the QL market, Finnegan feels that the price cuts may make QL games more viable. "We have no definites on the go as yet" he says, "but if we were approached by any programmers, I think we could give them some work."

Story of success

THE QL seems to be on the move again, thanks to the recent drastic price cut which puts the black beast, at £200, into the home market along with the C64 and Amstrad. "Orders have increased 134 fold," says Joe Woods of Terry Blood Distribution, the sole UK distributor of Sinclair hardware. "We've had to re-order twice and have another 2,500 on order now. Sinclair can't supply us quickly enough."

Sinclair Research is slightly more reticent about the success of the strategy. "At this stage it's too early to give any exact indication," temporises a spokesperson. "We don't want to blow our own trumpet too loudly."

One minor addition to the QL is the inclusion of a set of five 'games' with the machine on a single cartridge. Those are not intended as serious entertainment, but as simple examples of SuperBasic programs.

The price cut does however bring the QL into play as a possible games machine, and the number of software companies writing games for it is beginning to grow.

Meanwhile it seems Digital Research, which produces the GEM operating system used on the Atari ST68000-based computers, has been discussing the possibility of putting GEM on the QL. The most logical way of doing that would be as a ROM-based system held onboard, refuelling speculation that a new QL, or QL-based 16-bit micro, is in the pipeline.

Now that the QL is down to £200, the possibility of a more sophisticated machine to compete with the Atari at around the £500 mark seems much more reasonable.

more news on page 8

Railway success

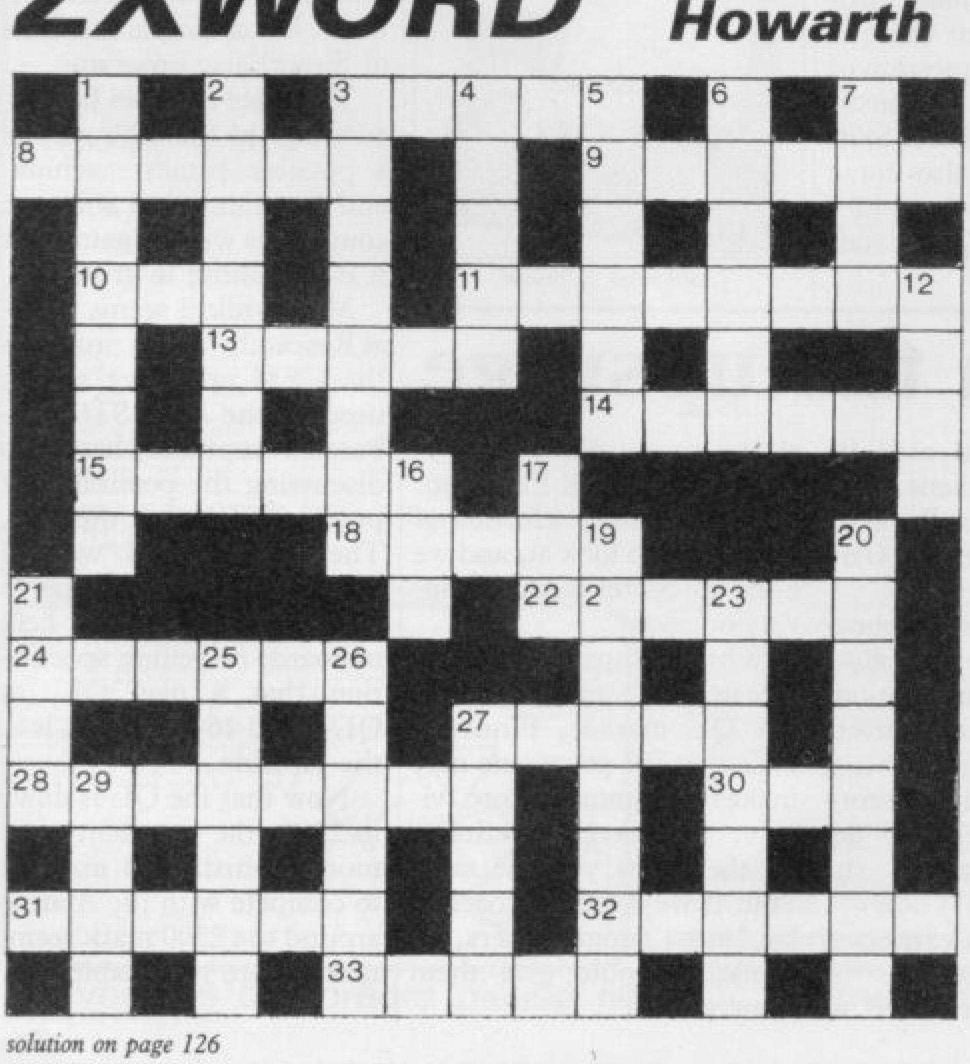


THE FIRST prize winner in our **Southern Belle** competition is Scott Garner of Thurmaston, Leicester. Scott wins a day out for two at the Didcot Railway Centre, as well as a copy of the game.

The 99 runners-up, who each win a copy of the game, are:

J Leist, Addlestone, Surrey; Philip Cooper, Harwich, Essex; P Austen, Bromley, Kent; Shani Connor, Wildwood, Stafford; Avril Greenland, London W6; John Hooley, Twickenham, Middlesex; P Reader, Slough, Berkshire; R D Ward, Hull, Yorkshire; Anthony Billington, Huddersfield, West Yorkshire; M D A Thorburn, Kimbolton, Cambridge; A D Brown, Skelton, York; Andrew Steels, Whetstone; Nigel Parsons, Canton, Cardiff; N Sturt, London SE13; D Askey, Gosforth, Newcastle-on-Tyne; Mark Jablonski, Sunnyhill, Derby; C Dickinson, Alsager, Stoke-on-Trent; T Stone, Milton Keynes, Buckingham; Martin Wilson, Horsham, West Sussex; K G White, Weston-Super-Mare, Avon; H D MacGregor, Frome, Somerset; C Paulton, St Helens, Merseyside; M Wills, Burnley, Lancashire; J Marks, Redcar, Cleveland; Paul Saunders, Gosport, Hampshire; Steven Johnson, Hythe, Kent; Jonathan Ralph, Pinner, Middlesex; R Gray, Worthing, West Sussex; A Frith, York; K Starling, Wisbeach, Cambridge; Michelle Booth, Leeds, Yorkshire; Stephen Rymill, Wirral, Merseyside; Julian Shilton, Street, Somerset; Damian Dix, Newark, Nottingham; A B Davis, Frinton-on-Sea, Essex; Kevan Keech, Blaby, Leicestershire; I Arkieson, Fareham, Hampshire; Shaun Horan, St Helens, Merseyside; Chris Marsden, Locne, Lancashire; David Lawson, Preston, Lancashire; I Coupland, Chelmsford, Essex; Matthew Jessop, Bexley, Kent; W Moon, Aldershot, Hampshire; J H Cross, Clevedon, Avon; John Greenhalg, Sowerby Bridge, Halifax; H Lynes, Carshalton, Surrey; Anthony Wells, Ashford, Middlesex; John Latimer, Greenisland, County Antrim; Gordon Casely, Blackhall, Edinburgh; A H Tuley, Ashtead, Surrey; M Coleman, Shorham-by-Sea, West Sussex; Howard Carlisle, Horsforth, Leeds; S Minns, Northampton; Martin Gillespie, Dunmurry, Belfast; Nicholas Attwood, Chester-Le-Street, County Durham; J Thwaites, Staining, Blackpool; Steve Edwards, Swinton, Manchester; M A Hollinrake, Chessington, Surrey; T Grylls, Yelverton, Devon; J Dammon, Saxmundham, Suffolk; Roger Coleman, Guildford, Surrey; Furico Goncalves, Coimbra, Portugal; P H Scott, Chippenham, Wiltshire; Marc Doyle, Gateshead, Tyne & Wear; D Mildren, Taunton, Somerset; M P Hasler, Fareham, Hampshire; Eric Basire, Harrow, Middlesex; Matthew Eva, Wickford, Essex; G A Pearson, Rugeley, Staffordshire; David Drury, Warley, West Midlands; T W Wells, London SE23; S Oglesby, RAF Gaton, BFPO 45; Joe Helden, Glenrothes, Fife; P Broad, Croydon, Surrey; J R Penley-Martin, Diss, Norfolk; Paul Storey, Hornchurch, Essex; Fabio Fachim Secchelli, Genova, Italy; Paul Davis, Hounslow, Middlesex; A Marley, Kenton, Newcastle-upon-Tyne; Terry Ferrell, Sidcup, Kent; J M Phillips, Chelmsford, Essex; Evan Seatter, Aberdeen, Scotland; W Brownless, Peterlee, County Durham; I P Andrews, Portsmouth, Hampshire; I Dex, Dunbartonshire, Scotland; Francesco Stajano, Roma, Italy; Jeff Bate, Roehampton, London; D Webb, Bletchley, Milton Keynes; Paul Serbert, Harrogate, North Yorkshire; P Clessman, Waterlooville, Hampshire; N M Robinson, Romford, Essex; Paul Davidge, Truro, Cornwall; Lars-Einar Abrahamsson, Oviken, Sweden; David Gazey, Wooton, Isle of Wight; C McCardle, Marsh, Lancaster; R Bryce, Haverfordwest, Dyfed; Peter Murphy, Newport, Gwent; B Phillips, Chelmsford, Essex; J P Drake, Otley, West Yorkshire.

ZXWORD by Henry Howarth



solution on page 126

Across

3. . . . . room for another Spectrum key (5)
8. ROM apt to alter the highest address of Basic code (6)
9. Research Machines getting B minus for 16 bit (6)
10. Fixed the TV (3)
11. Main gaze diverted by journal (8)
13. Smite out at pieces of information (5)
14. + finish – not the augend (6)
15. Tory, perhaps, like Arthur Daley (3-3)
18. Birds nesting in castles on board (5)
22. It's assembled, of course (6)
24. See through graphic feature (6)
27. Frankly, he's a boxer (5)
28. Disgracefully (4 TO 11), yet elegant (8)
30. Macho chess-pieces (3)
31. Australian captain making a statement about Spectrum graphics? (6)
32. The beginnings of a graph (6)
33. Student demo or C5, perhaps (3-2)

Down

1. Confused cops lack the key (4, 4)
2. Networked goods depot, perhaps (7)
3. Long thin key in the Cosmic Arms, perhaps (5, 3)
4. Micros the Electron runs circles round? (5)
5. Nazi IT in game setting (6)
6. Astonished by a Hampton Court puzzle, note (6)
7. Runt ruined a go (4)
12. Ted, perhaps, induced current (4)
16. Its a function is to invert, a bit (3)
17. Be systematic, initially, with the metre, kilogram and second (3)
19. The answer is found in chemical mixture (8)
20. To do with language of mutated mice and ants (8)
21. Realise a small branch (4)
23. Like an equilateral parallelogram (7)
25. Fathom characters 4, 5, 3, 15, 4, 5 (6)
26. Chips with ice-cream? (6)
27. Zap alien or Eprom? (5)
29. Space in RAM left, but zero in ROM (4)

Top tracks

COMPILATION cassettes have become the rage in recent months, especially since the successful **Softaid** package released last summer. No need to write a new game, just bung a few best sellers together and Bob's your uncle.

They Sold a Million is no exception and will be launched on the Hit Squad label created by Ocean for this venture. The compilation comprises four top selling games — Ocean's **Daley Thompson's Decathlon**, Ultimate's **Sabre Wulf**, US Gold's **Beach-Head** and Software Projects' **Jet Set Willy**.

The unlikely title refers to the fact that, in their heyday, the combined sales of those four games were around a million — at some point they each occupied the coveted number one slot in the charts. "If we sell another million, we will be only too pleased," says Ocean's David Ward.

"We took a leaf out of the record industry's book," continues Ward. "The best selling compilation records are those with top tracks on them — they really sell."

You probably own at least one of the four games, but the package represents excellent value, retailing at £9.95 and is due to be released in the first week of November. It will be presented in a twin cassette box.

Softaid 2

SOFTAID, the charity compilation for Ethiopia, may be followed by a successor in the New Year.

"**Softaid 2** is a consideration," says Rod Cousens, one of the leading lights behind the original package. "An awful lot of work would have to be done before it would be feasible."

If a new compilation is put together, it would have to be in the new year as the distributors, who gave their time and services free to the Ethiopia appeal, will not have much spare time during the busy Christmas period.

Astronomical Talent

TALENT is about to release an astronomy program for the QL.

Called **Cosmos**, the program will provide a display of the sky for any latitude, time, date and year. A cursor can be positioned over objects and information is then provided on the star or planet; Halley's comet is also featured.

You can also get displays of the phases of the planets, the positions of the four largest moons of Jupiter, and the alignment of the rings of Saturn, thus enabling you to plan your next extraterrestrial holiday with precision.

According to Talent's John Tweedie, **Cosmos** should be available, mail order only, from the end of October, at a price of £14.95.

Meanwhile Talent has also cut the price of **Cartridge Doctor** to £14.95.

Talent is also planning to branch out with programs for the Atari ST, with a database and adventure twin-pack as the first two releases. But there are no plans to reduce the level of support given to the QL, and Tweedie says the idea is to give roughly equal attention to both machines. "In terms of sheer value for money," he says, "the QL is unrivalled."

GALLUP TOP 30

This chart is compiled by Gallup by sampling sales at 250 retail outlets, including high street chain stores and independent home computer shops

MONTH ENDING SEPT 14

1	◆	WAY OF THE EXPLODING FIST	MELBOURNE HOUSE
2	◆	NIGHTSHADE	ULTIMATE
3	◇	FRANK BRUNO'S BOXING	ELITE
4	◆	DALEY THOMPSON'S SUPERTEST	OCEAN
5	◇	HYPERSPORTS	IMAGINE
6	◆	NOW GAMES	VARIOUS/VIRGIN
7	◆	FRANKIE GOES TO HOLLYWOOD	OCEAN
8	◆	HIGHWAY ENCOUNTER	VORTEX
9	◆	DAMBUSTERS	US GOLD
10	◆	SOUTHERN BELLE	HEWSON CONSULTANTS
11	◇	DYNAMITE DAN	MIRRORSOFT
12	◇	JET SET WILLY 2	SOFTWARE PROJECTS
13	◇	SOFT AID	VARIOUS
14	◇	ACTION BIKER	MASTERTRONIC
15	◇	SPY vs SPY	BEYOND
16	◇	SPY HUNTER	US GOLD
17	◆	FINDERS KEEPERS	MASTERTRONIC
18	◇	POLE POSITION	US GOLD
19	◆	CYLU	FIREBIRD
20	◆	RED ARROWS	DATABASE
21	◇	NODES OF YESOD	ODIN
22	◇	GLASS	QUICKSILVA
23	◆	RED MOON	LEVEL 9
24	◇	WORLD SERIES BASKETBALL	IMAGINE
25	◇	BRUCE LEE	US GOLD
26	◇	NONTERRAQUEOUS	MASTERTRONIC
27	◇	NICK FALDO'S OPEN GOLF	ARGUS
28	◇	EMPIRE FIGHTS BACK	MASTERTRONIC
29	◆	CHILLER	MASTERTRONIC
30	◇	DALEY THOMPSON'S DECATHLON	OCEAN

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2. Ski Jump
3. Basketball
4. Frogger
5. Breakout
6. Crusher
7. Startrek
8. Martian Knockout
9. Boggles
10. Alien Attack
11. Lunar Landing
12. Maze Eater
13. Microtrap
14. Motorway
15. Labyrinth
16. Skittles
17. Race Track
18. Ski Run
19. Tanks
20. Solar Ship
21. Ten Pins
22. Cars
23. Stomper
24. Pinball
25. Cavern
26. Laser
27. Alien
28. Cargo
29. The Race
30. The Skull
31. Orbit
32. Munch
33. Bowls
34. Raiders
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Faulty Spectrums errors corrected

YOUR ARTICLE in the September issue concerning returns of Spectrum Plusses, quoting a spokesman from Boots, unfortunately contains three errors which I would like to correct.

Concerning power supplies, Timex does not supply any power supplies to Sinclair Research. All computers are supplied in bulk to Sinclair's distributor who procures power supplies, cables, software and instruction manuals and does the final packing. We have no influence over the procurement of the power supplies which are used with our computers.

Secondly, the comment that Timex only carries out spot checks . . . Every computer manufactured by Timex has to undergo rigorous quality checks at various stages in the manufacture, and no computer leaves the plant without passing all these tests.

Thirdly, production of the Spectrum Plusses is not being switched from Timex to AB. Both Timex and AB manufacture Spectrum Plusses and continue to supply Sinclair Research.

We can assure the readers of your informative magazine that we at Timex put quality first in all our products to ensure customer satisfaction.

**B F Lawson,
Managing Director,
Timex Corporation,
Dundee**

Immature nonentities

I WAS MOST concerned by the attitude taken by the group calling themselves Torus, whom you interviewed in the Hit Squad section of September's issue.

Although I found their smug behaviour rather pathetic, it is not of this that I write — it has to be tolerated from immature little nonentities just making the 'big time'.



Torus: load of bull

What really angered me was their rather cutting remark about David Webb's masterpiece **Starion** being 'junk' on the grounds of originality, or lack of it. Despite being grossly inaccurate, it also seems to me to be something hypocritical with regard to their offering of **Gyron** — hardly the first maze game available from the Spectrum, albeit a laborious, second rate one.

Torus, don't even try and compete with D Webb's mastery of the Z80 and Spectrum ROM — he's in a different league.

**N A Foster,
Hinckley,
Leicestershire**

The morality of piracy

HI! I've read the 'The Spanish Connection' in the news section of the August issue. If you publish such junk in your magazine you have not even seen piracy yet.

I, for instance, swap programs with people from Holland, Yugoslavia, Canada, France, S Africa etc — and Israel of course — and I have not come across a Spectrum owner who hasn't got at least 300 programs.

You reported on a tape magazine, well, I can report on at least 10 of that kind. There is a special section in Israel's best selling computer magazine especially for piracy where one can send a free ad in. There are also hundreds, if not thousands, of home made copying machines. I usually get all games about 1.5 months before even get even reviewed in magazines such as yours.

Piracy is due to the price which we pay for software here in Israel. A typical program can cost $20 to $30 and so-called budget software about $8.00. Secondly we have to wait about a month from when software is launched in Britain to when it is imported here.

If software houses would agree to post games overseas and accept international money, and not ask for ridiculous p&p charges, that would help. Any company willing to sell overseas should state that on their adverts.

**P D,
Israel**

● *Another self-righteous pirate who wishes to remain anonymous. I think I'll leave it up to the following letter to state the obvious . . .*

I HAVE READ with interest Martin Scholes letter in your March issue concerning software piracy, and would like to ask him a question.

If I want a given game, and know no one who has a copy I could pirate from, is it moral to steal one from the shelf of the shop?

Or, to give my question a wider phrasing, if I cannot afford what I want, is it moral to steal it?

**R Olgiati,
Courbevoie,
France**

Garbage in, garbage out

I HAVE read your reviews of **Action Biker** in September's issue and I think you are totally out of line. What you said about it was pathetic and I think you have a cheek saying that it is garbage because it is only £1.99. To sum up, I think you are garbage.

**A M Whitlock,
Barry,
South Wales**



● *Garbage replies: You're entitled to your misguided and idiosyncratic opinion but that doesn't alter the fact that there's a whole lot of software out there infinitely more entertaining than* **Action Biker**, *even in the budget software price range. Still, if you've pocket money to burn and like KP Scraps or whatever they're called, then obviously it's a winner.*

Praise for budget games

REFERRING to Clare Edgeley's article Programs for Profit, in the August issue. Distributors seem to take a percentage profit from the selling price of a program which bears little relation to the amount of effort that they put into making a program a success.

While ensuring that programs which are not top ten chart material are consigned to the classified ads at the back of magazines, they are creaming off an enormous profit merely for providing a warehouse and a telephone.

Budget software, while initially of low quality, is now starting to catch up with a lot of software sold at full price. The reason for this success is that the customer is much more likely to splash out £2-£3 on a game than he or she is to waste £6-£10 on a program which is just as likely to be worthless.

David May, London W4

● *Too true. Let's hear it for* **Action Biker!**


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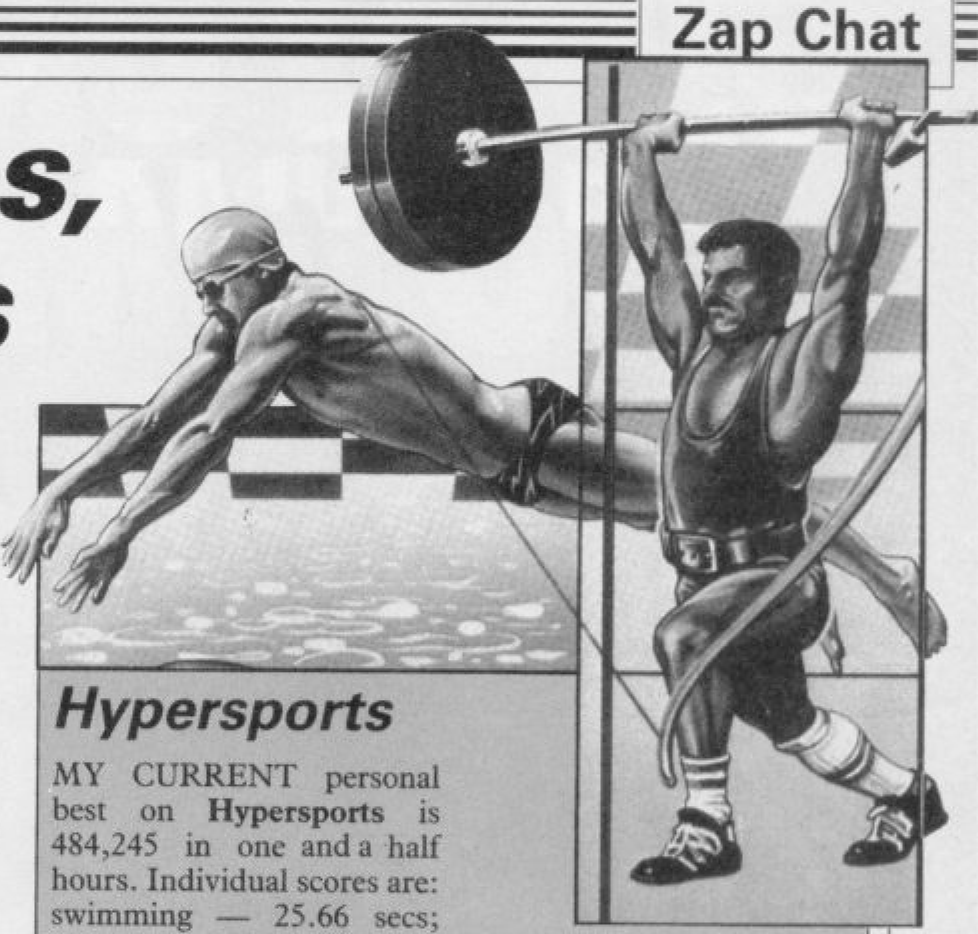
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Hyperscores, Jet Set tips



Jet Set 2

I HAVE just completed hacking through **Jet Set Willy 2**. Here is a short program for anybody still stuck in the game.

Change the number in line 20 to alter the number of objects needed to complete the game. Altering line 30 changes the start room (1-134):

```
10 CLEAR 64999
20 LET obj=150
30 LET room=32
40 FOR n=65000 TO 65047: READ a: POKE n,a: NEXT n
50 PAPER 0: INK 0: BORDER 0: CLS
60 RANDOMIZE USR 65000
70 DATA 221,33,0,64,17,56,185,62,255,55,205,86,5,243,48,240
80 DATA 33,6,254,17,197,100,1,59,0,237,176,195,0,95
90 DATA 62,255,50,67,117
100 DATA 62,obj,50,126,135
110 DATA 62,room,50,75,117
120 DATA 195,0,112
```

Gareth Henry,
Colne,
Wiltshire

Frank Bruno

THE codes for **Frank Bruno's Boxing**, prefixed with the name STE, are:

Canadian Crusher — Fling Long Chop BS8N8NMA0
Andra Puncheredov AMC1NAK9C
Tribal Trouble FQ6IN9SN9
Frenchie IKAIIBQN3
Ravioli Mafiosi INDIIAOM6
Antipodean Andy NR7IN9MI4
Peter Perfect ILBIIOKN1

To beat Peter Perfect keep punching him with a right hand face blow and when you finally get through, switch immediately to a left hand body blow, then back to the right hand face blow and so on.

Steven Hoy,
Warrington, Cheshire

3D Starstrike

A TIP for those fans of **3D Starstrike**.

Press key 1 to pause, then type in 'I wanna cheat.' This will give you infinite shields. If you get bored, then press key 1 to pause again, then type in 'boring' and it will return to normal.

M Sheepwash,
Bredhurst, Kent

● *Are your sure about this?*

Hypersports

MY CURRENT personal best on **Hypersports** is 484,245 in one and a half hours. Individual scores are: swimming — 25.66 secs; shooting — 9800; long horse — 9.99; archery — 4600; triple jump — 20m; weightlifting — 250kg.

Darren Shaddady,
Bickerstaffe,
Lancashire

● *We have received record breaking* **Hypersports** *scores by the bucket load, and though the above is the highest overall score achieved, some individual event scores are worthy of note, namely Mark Coakley of Newcastle with 25.01 secs in swimming and 9900 in shooting.*

Wizard's Lair

HERE ARE the codes for the magic lift in **Wizard's Lair**.

Caive; Hawlo; Liayr; Lyons; Dungn; Crypt; Vault.

Mark Coates,
Willerby, Hull

Skool Daze

IN T Nicholsons letter — April — about **Skool Daze** he wrote that the battle of San Jacinto and the battle of Eversham both had a date of 1265, where as San Jacinto is 1830. Some more dates of battles are as follows:

Gettysburg 1863; Bannockburn 1314; Yorktown 1781; Agincourt 1415.

D Hart,
Luton,
Bedfordshire

High scores

ON **Skool Daze** I have scored 13270 with all shields flashing. On **Tapper** I have scored 96900 and reached level four. Has anybody finished those games yet?

Christopher Boules,
Tavistock,
Devon

I HAVE just completed **Way of the Exploding Fist** with a score of 71,200. On reaching 10th Dan you carry on until you are beaten. The best technique is the floor sweep.

Owen Thomas,
Writtle,
Essex

I HAVE completed **Bruce Lee** 31 times. I had 32 falls left and my highest score was 1,550,625. I have scored 561,120 on **Spy Hunter**.

Steven Davies,
Linton,
Cambridgeshire

MY HIGHEST rank on **Glass** is Fleet Commander with a score of 82,940 and Grand Master Spy on **Spy vs Spy** with 9,314 points.

Wayne Morledge,
Ilkeston,
Derbyshire

I HAVE completed **Roland's Rat Race** twice, with a fastest time of 8:51:49.

M Colley,
Cardiff

● *That's fast?*

GRAEME Evans and I finished **Shadowfire** on August 23 in two hours, two minutes and 59 seconds. Are we the first?

Paul Dickson,
Livingston,
Scotland

ON AUGUST 30 we finished **Roland's Rat Race** with a score of 16,900. Yeah!

Jason Brown
and Simon Furrell,
Portsmouth


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SINCLAIR USER CLASSIC

SINCLAIR USER Classics are programs which, in our biased and eccentric opinion, set new standards in software. They are the programs by which the others should be measured. If you buy no other software, buy these. No self-respecting Sinclair user should be without them.

Software reviews carry a star rating, the basis of which will be value for money. Programming, graphics, speed, presentation, addictive qualities and the rest are taken into account.

Guide to ratings
★★★★★ 24 carat. Buy it
★★★★ Value for money
★★★ Nothing special
★★ Over-priced
★ A rip-off



Starquake

RIGHT. There's this planet popping out of a black hole somewhere and, as you might be in similar circumstances, it's unstable. Rotten to the core, in fact. So Blob, the Bio-Logically Operated Being — groan — is sent out to repair the core before it blows up.

All of which is a rather thin excuse for 500 screens of Ultimate-style mayhem as Blob battles a colourful mob of inventive nasties — giant fleas, small spiky birds, who cares as long as they're fast and deadly? — while collecting the various bits needed.

Starquake is not just an **Underwurlde** clone. There's a profusion of special features to suss out. A teleport system is of great use in moving swiftly from one set of caverns to another, but you have to know the codename of the appropriate teleport. Blob has a set of little platforms which he can use like a ladder and there is a number of flying pads about. But . . . you can't use a teleport if you have a pad, and you can only leave a pad where a pad should be left, so . . . life gets hairy.

Add to that the ubiquitous credit card which gives you access to various doors and special swapshop pyramids where you can exchange objects, and there's a bewildering variety of strategies to explore to win.

The graphics are of the highest quality — fast, flicker free and attractively detailed. The ingredients needed to repair the core vary from game to game so it's always a challenge. Fortunately there are extra lives available so you can get your head down for a long game once you gain a little cavern-credibility. We love it, and if Ultimate hadn't done most of it yonks ago we'd have given it a Classic. Buy and enjoy.

Chris Bourne

Publisher Bubble Bus **Price** £7.95
Memory 48K **Joystick** Kempston, cursor, Sinclair
★★★★★



Potty Professor

EVER WANTED to be a crazy inventor, building amazing contraptions to boil eggs or toss pancakes?

It's been a well-loved theme for centuries, culminating in those wonderful illustrations by Heath Robinson for the Professor Branestawm books. Now Software Farm, previously associated with hi-res ZX-81 games, has tranferred the whole idea to the Spectrum.

Potty Professor isn't really a game at all, in the conventional sense. You are given six problems to solve, and a variety of objects to build a machine which will do the job. By way of example, the first problem is to flush a toilet, using a dog, cat, bucket, watering-can, one ton weight, see-saw, balloon, blowtorch and tongs.

A cursor selects objects and moves them around the screen. When you think you have a workable machine, you press a button to set it going and watch the results. If you are not successful the contraption falls apart.

Objects can be used two or three times in a machine, and some won't be needed at all — they are there to confuse you. You should experiment by seeing what small combinations of objects do to each other.

The animations are well-done within fairly crude cartoon limits. Outstanding is the steam engine used in the egg-frying problem, which puffs and shudders most convincingly. There are a few problems with the way some objects connect, graphically speaking, but that is inevitable.



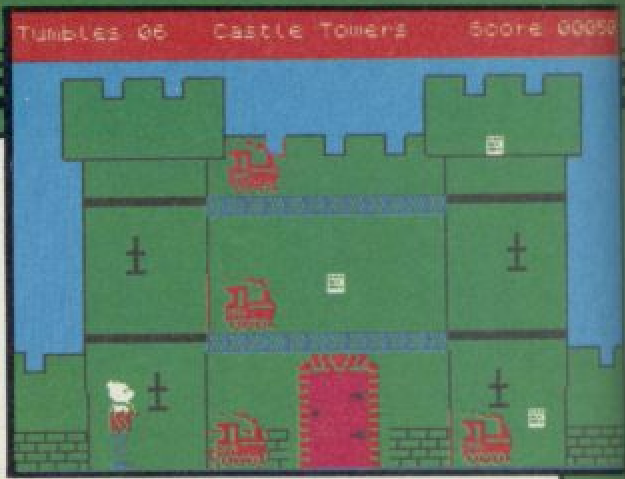
It's a super idea for a program, marred only by the fact that once you have solved the six problems there is not much else you can do. Although the problems are extremely difficult, the program has a limited playing life. Mind you, you'll probably want to show the inventions to your friends anyway.

Had the game included an option to design your own machines, which would have given it unlimited playability, it might have achieved a higher star rating. As it is, **Potty Professor** is still well worth buying for it's originality and sheer good humour. It's certainly a fine omen for future Software Farm productions.

Chris Bourne

Publisher Software Farm **Price** £6.95
Memory 48K **Joystick** Kempston, cursor, Sinclair
★★★★

more software on page 22



Rupert and the Toymaker's Party



RUPERT has been left behind by his pals, who have gone off for a taste of ginger beer and cream buns at the Toymaker's party.

Ravenous beast that he is, Rupert just has to get to all that food and you can help him past the guards and into the castle where the party is held. Just guide him through the eight levels, picking up the invitations which his friends have left behind to guide him on his way. When you have picked up all the invitations on one level, you can move through to the next.

Each level consists of four linked screens, which in turn have three floors. You can jump on barrels, potted plants and staircases to move up to new floors. If one of the soldiers or birds collides with you, Rupert will be forced down to the ground level again.

In each section of the castle you have a limited number of lives which Quicksilva has decided to call Tumbles. The number you have will depend upon the level of difficulty. If you run out of tumbles you will be abruptly marched off the screen by a soldier. Disgraceful!

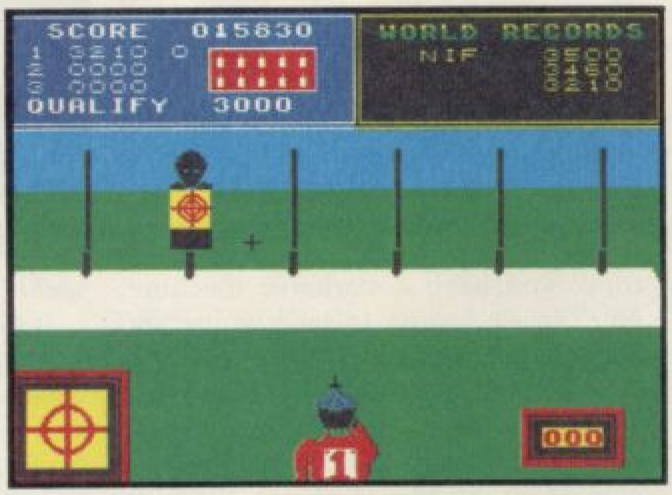
Rupert must be starving if he insists on being submitted to the gruelling tests of the Toymaker's castle. Why won't the guards let him into the castle? Has he collected enough invitations? Where is he putting them all? Why is a grown-up playing this game? Those are not the sort of questions which young children will ask and Rupert is a game for the kids.

They might find that it is almost impossible to get off the third screen, or that the graphics are fairly simple, but that might not bother them.

The game is a disappointment, I used to be an avid Rupert fan and his appearance in this game is not how I remember him.

John Gilbert

Publisher Quicksilva **Price** £7.99
Memory 48K **Joystick** Kempston, Sinclair
★★★★





Daley Thompson's Super-Test

CAN DALEY THOMPSON keep up the pace of Decathlon with his new Super-Test?

There are eight new events with all but one requiring the agonizing bashing technique of successive key pressing or rapid left and right joystick movement for building and maintaining speed.

Events such as cycling, pistol shooting, rowing, goal scoring and tug o' war are straightforward, while others — spring board diving, ski jump and slalom — require speed and additional co-ordination.

With the ski jump Daley descends the slope, takes off near the edge and lands safely. All three movements are controlled by you. In the diving event his take-off height, number of somersaults achieved and entry into the water are again your domain.

The format remains the same as Decathlon in that scores and qualifying times are displayed, but there are no stamina plus energy-sapping combinations, like the 400 metres, and only one event has an 'angle-ometer'.

The graphics are large, clear and colourful. Great care has been taken to create an environment allowing you to enjoy watching and playing. For instance, the ski jump scene is split into three windows, one showing a close-up side view of Daley on the slope while the other two show side and elevated views of the course.

Both sides of the cassette have been filled, which makes it very reasonably priced.

Colette McDermott

Publisher Ocean **Price** £6.95
Memory 48K **Joystick** Any
★★★★

Elite

THE COBRA'S huge engines moan into life as you sit tensely at the controls waiting to be shot out of the space station.

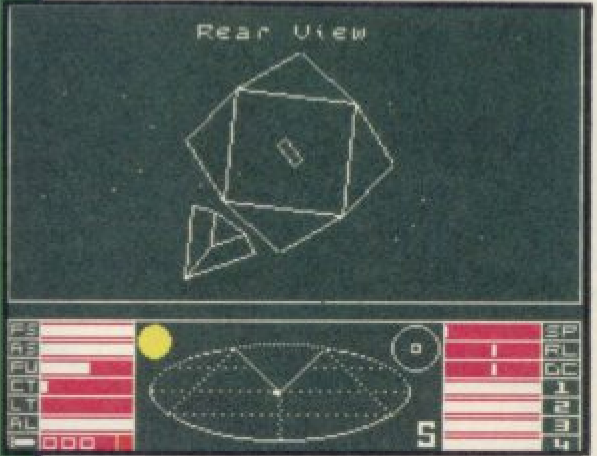
Your ship is the best of the medium-range, medium capacity, fighter traders and is ideal for transporting legal and illegal cargoes across the universe. It incorporates defensive screens, pulse lasers and missile launch facilities, while also being able to handle the jump to hyperspace.

Once you have cleared the Coriolis space station, orbiting around the planet Lave, you can look out into space, turning your 3D display window to look at the star fields.

Space travel can be achieved with small spurts of engine power or hyperspace, but only if aliens or police are not in the vicinity. If they are you must stand and fight. At the bottom of the screen you will find the flight grid scanner which displays other space ships or stations in your area. It is by using that, and the compass located on the right side of the screen, that you can track aliens.

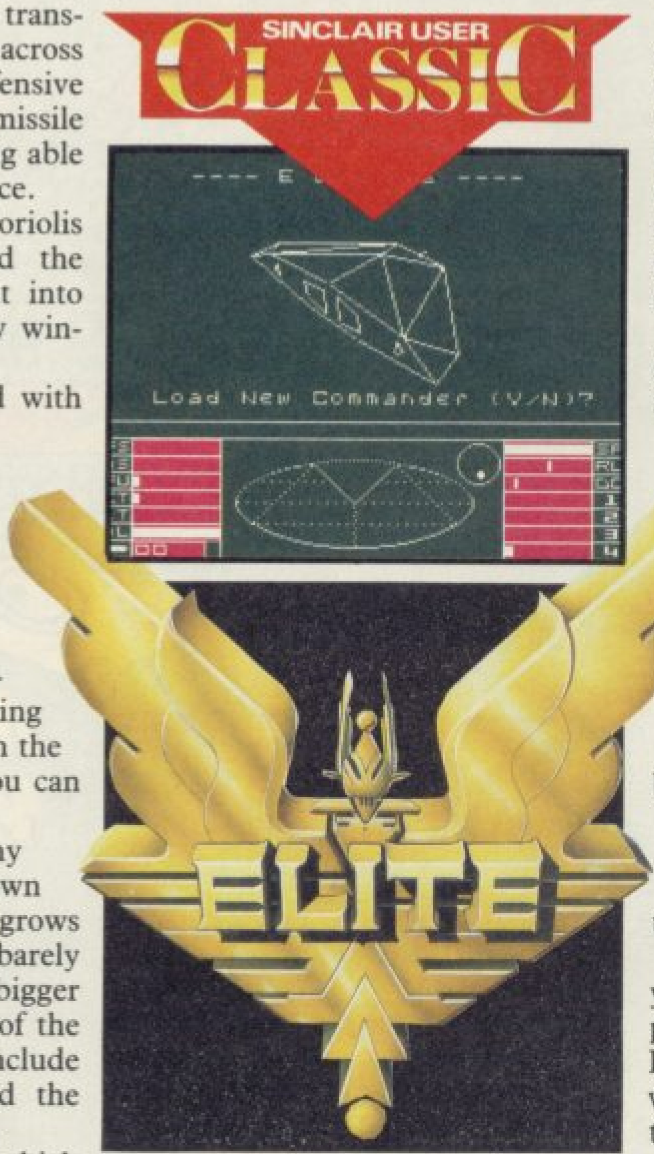
You will know when the enemy approaches as everything is shown in gory graphic glory. The craft grows from a speck to a shape which is barely recognisable. Then it grows bigger until you can identify it as one of the 10 ships in the game. Those include Adders, Mambas, Pythons and the deadly Thargoid invasion ships.

Each has its distinctive shape which is illustrated in the bulky, but indispensible, Space Traders Flight Training Manual. If you miss it with your lasers or missiles it will approach quickly, trying to keep out of your sight, and either spin past you or fire its weapons systems.



The authors have built range factors into the laser systems so that you cannot, for instance, use them to destroy a ship which is small and hundreds of light years away.

In some ways **Elite** can be described as a simulation. You are piloting a space vehicle which will only take so much stress and strain and steering is more complex than in most space games. You can even become disorientated and have to rely on your instruments if you bank too sharply.



The aliens will not sit still while you target your weapons and you will find that on many occasions you must control your ship's movement as well as operating the lasers or missile guidance system. You should be careful, too, not to over-compensate on the controls. Such action can send you into a wild spin.

The alien ships react in a believable manner. If hit hard enough they will not explode into nothing but break up. You can pick up the odd piece of cargo in that way, but beware the larger debris.

Fighting the forces of law and evil in space is only part of the game. You must earn a living, by buying and selling commodities from different planetary systems.

Home in on the planet of your choice, using the long range scanner, and ask for a report on inhabitants, the political climate and products.

The political climate is important and can influence trading links and attitudes. If you warp into a system where anarchy prevails you will soon find pirate ships on your tail. Goods are there for the taking.

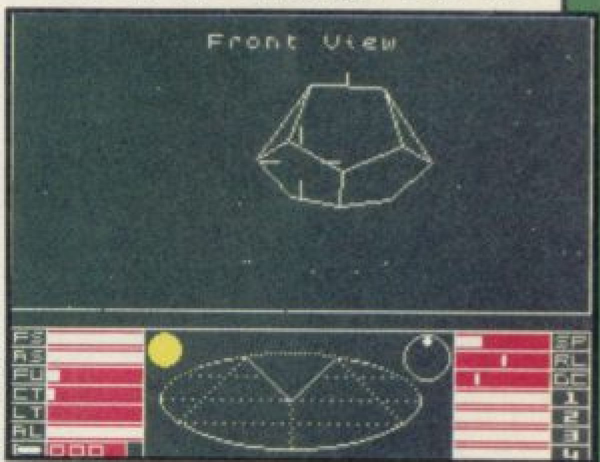
To get to a particular planetary system, you must switch your display to the long range scanner, position the cursor over the planet of your choice— which is within range — and press the hyperdrive activation key. You will, however, only get to a new system if you have destroyed all the aliens in the current sector.

When you arrive at a planet you can look at the list of available commodities. They include shipboard resources such as fuel, textiles, food and even illegal substances. If you decide to traffic in black market goods you will be regarded as an outlaw.

Elite is an unbelievably complex game with arcade, strategy and adventure elements. It will, inevitably, be compared with games such as **Starion** from Melbourne House. The graphics on both games are similar, but **Elite** has the edge with its 3D control panel, instruments which are constantly updated, and denser star field.

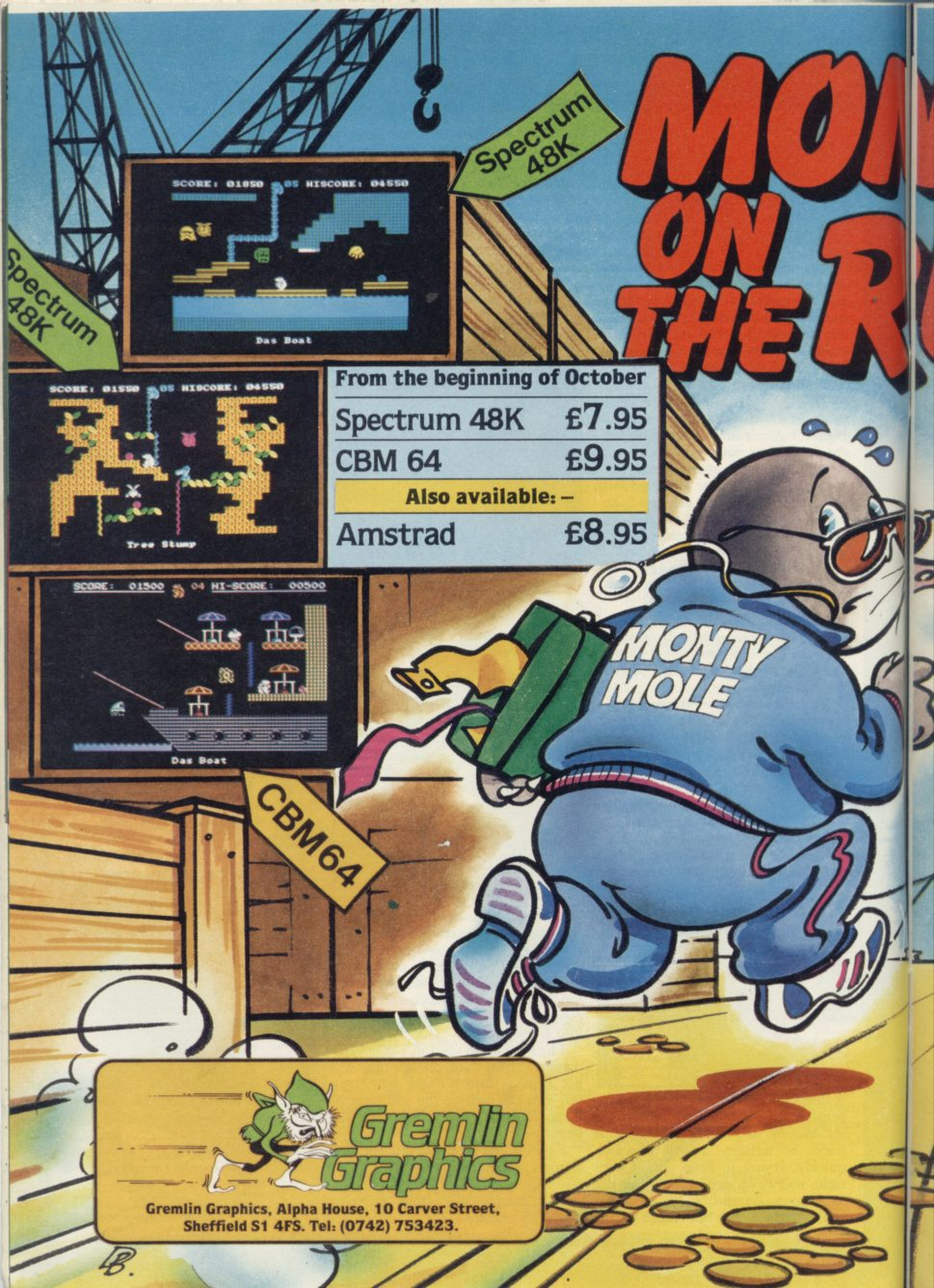
When you are not playing the game you can read the novel included in the package. *The Dark Wheel* by Robert Holdstock, a noted science fiction writer, develops the background to the game.

Take up the challenge. You are unlikely to find another space game of **Elite's** calibre this year. *John Gilbert*



Publisher Firebird **Price** £14.95
Memory 48K **Joystick** Kempston, cursor
★★★★★

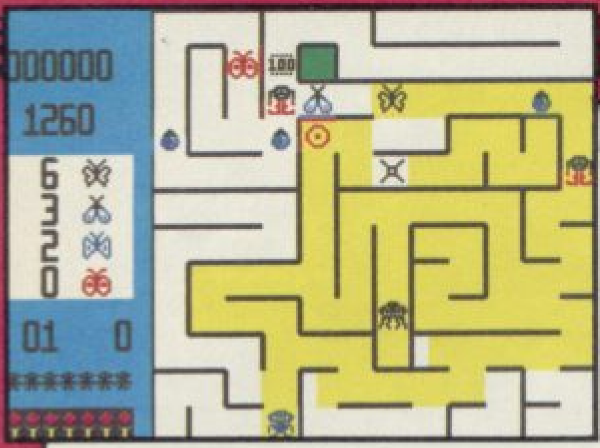
more software on page 26



ON
THE
Spectrum 48K
Spectrum 48K
SCORE: 01850 HISCORE: 04550
Das Boat
SCORE: 01550 HISCORE: 04550
Tree Stump
SCORE: 01500 04 HI-SCORE: 00500
Das Boat
CBM64
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MONTY MOLE
Gremlin Graphics
Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS. Tel: (0742) 753423.



NTY
RUN
CBM64
Spectrum 48K
CBM64
Spectrum 48K
SCORE: 01650 03 HI-SCORE: 00500
Tree Stump
SCORE: 00500 05 HISCORE: 04550
Escape Tunnel
SCORE: 00950 03 HI-SCORE: 00500
Sewerage Works
SCORE: 00250 05 HISCORE: 04550
The House
SCORE: 00250 04 HI-SCORE: 00500
The Hall Of Jow-an
SCORE: 01900 03 HI-SCORE: 00500
Drive Sir Clive's C5
SEALINK
Super fit and desperate for freedom, Monty makes his daring escape from Scudmore Prison. Hounded by the bastions of law and order, our frightened hero finds refuge with the criminal underworld who offer him his chance to breathe fresh air and bask in the sunlight once again. Moving from safe house to hideout to underground lair, Monty must select the correct five elements of his freedom kit from the many he's offered and not miss out on the hidden gold coins that will make him a mole of leisure.
At last he's free but can he make the cross-channel ferry on time?
CBM64
CBM64



Maze Craze

IF YOU DON'T like spiders, don't buy **Maze Craze.** If you're not mad about mazes, you may not love it either. If, on the other hand, your idea of bliss is to squash six-legged beasties while rushing round Hampton Court, then **Maze Craze** is what you've been waiting for.

The mazes are all contained on a single screen, and you must paint the whole maze yellow while collecting a set number of different butterflies. The mazes and butterflies vary from game to game, so there's none of your 'how-to-get-past-the-first-screen' nonsense here.

The butterflies hatch out of eggs laid by various creepy-crawlies which are deadly in themselves, so you'll have to be careful. There are also monstrous beetles which eat up your yellow paint. Respite comes in the form of special mazes, which you enter when running over frogs and bugs — there seem to be be at least half a dozen of those which can add to your bonus points.

The graphics are blocky and simple on a white background — a pleasant experience to the aching eyes of a hard-pressed reviewer, though hardly state-of-the-art. What the graphics lack, however, is well made up in intelligent gameplay, so that the mazes do represent a genuine if increasingly difficult challenge.

Maze Craze is a good, unpretentious game, with plenty of extra lives to enable you to play for some time, and lots of challenge. Just the right sort of refreshment after a couple of months of high-powered arcade-adenture mega-quests to keep good game-players on the straight and narrow.

Chris Bourne

Publisher Partytime **Price** £6.95
Memory 48K **Joystick** Kempston, Sinclair, cursor
★★★★

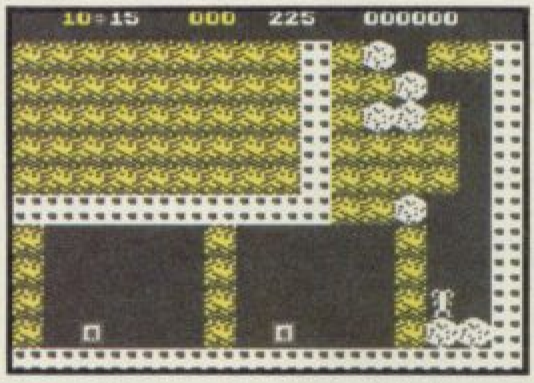
Rockford's Riot

MONOLITH'S **Rockford's Riot** is the sequel to Beyond's **Boulder Dash**, featuring the same stick-like, foot-tapping character.

Guide Rockford around a boulder-strewn maze and pick up as many jewels as the diamond-crazed little chap can hold. Boulders hang precariously and the lightest touch will send them tumbling and crashing.

There are 16 caverns — each progressively more difficult. Getting past the deadly fireflies on the first level is no easy task and working out how to activate an enchanted wall may make you run off screaming. Luckily the demo mode gives a clue.

Butterflies and deadly amoeba feature in later stages. You can use the boulders to block off passageways, turn the butterflies into diamonds or merely squash them.



As in **Boulder Dash**, movement is smooth although scrolling is very jerky and the graphics are basic. The game takes a while to reset when a life is lost and that becomes frustrating.

Having said that, there are some very real problems to overcome.

Rockford's Riot is packaged — in a ludicrous vertical box crowned by a luminous disc — with **Boulder Dash**, so you see exactly how similar both games are.

Clare Edgeley

Publisher Monolith **Price** £9.95
Memory 48K **Joystick** Kempston, AGF, Protek, Sinclair
★★★

Evil Crown

HERE'S an oddity — a throwback to **Dictator** and all those games where you decide how much food to give the peasants and how much land to cultivate and how much longer to play.

Evil Crown is set in mediaeval England, and you have to extend your fame and prosperity as one of those wicked barons of old. Everything's driven by icons.



The main part involves assigning areas of land to be cultivated, setting taxes, deciding what to pay the king to avoid providing soldiers for his risky wars and setting aside a sum for the annual tournament.

Once that's over, you get the hunt, where a beast moves across the screen. You don't get to kill it, you watch instead. Lucky beast.

Then there's the tournament, a real lulu. The two knights thunder down with the sort of stunted sound effects you might expect. Meanwhile you're trying to keep your lance tip on a red shield which leaps about a picture of a knight. Unfortunately you're just as likely to lose anyway — and that goes for the rest of the game. Although our pre-production copy had a bug on the joystick menu, which Argus swears will be fixed, the rest of the game is said to be complete.

If that's the case, then it's also virtually unplayable. Peasants revolt and land disappears for no obvious reason. No matter how much you spend on your militia, you always seem to lose the battles.

We rang Argus to see what we were doing wrong. After getting some tips, we set taxes and the rest at the recommended rates and out we went again.

Evil Crown really ought to be a good, witty game with lots of detail. Instead it's dull, constructed and ultimately worthless.

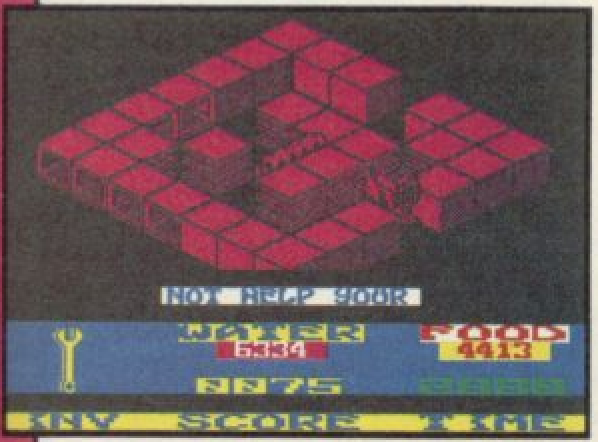
Chris Bourne

Publisher Argus/Mind Games
Price £9.99 **Memory** 48K
Joystick cursor, Sinclair, Kempston
★

Chimera

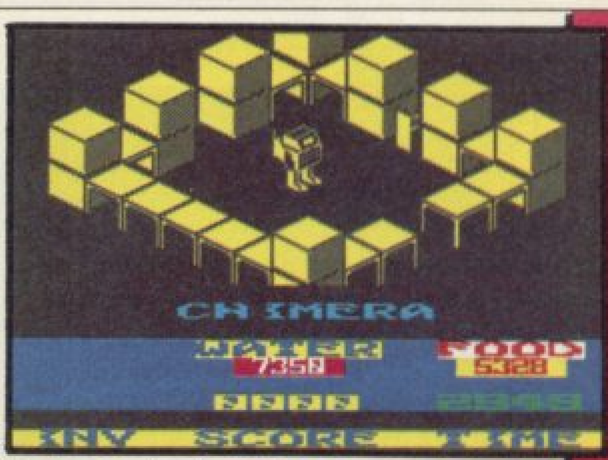
FIREBIRD kicks off its new Super Silver range with another **Alien 8** lookalike, **Chimera.** You play a little robot sent to investigate what the Americans reckon is a Russian satellite. Instead it turns out to be — well, you'll have to complete the map to see the ghostly truth.

The idea is to blow up the ship by constructing warheads and priming them in the correct rooms. Your water and food supply provide limits to the game, as well as a straight time limit. Fortunately you can replenish the former two with mugs of liquid or nutritious loaves of bread, but watch out — you may need to use those objects for other purposes so guzzle with discretion.



Mapping is vital, as the game contains a great deal of strategy, and to succeed requires careful planning of routes. The similarity to the Ultimate games rests on the 3D graphics and movement of the robot, but it falls short of allowing you to jump or move objects around, except by carrying them.

Hazards include radiators, egg-timers and electric toasters. It's a very domestic environment, but they're all deadly unless you have the right equipment to destroy them. Luckily there are computer terminals around which will give you clues, but use them sparingly — they are scarce.



Although not up to the highest standard of the Ultimate games, **Chimera** does represent terrific value for money, and those who enjoy these maze-quest arcade-adventures should not hesitate to fork out the pennies for an excellent addition to the genre.

Chris Bourne

Publisher Firebird **Price** £3.50
Memory 48K **Joystick** Kempston, Sinclair, cursor
★★★★★

Magic

MAGIC MEANS mystery and computers can make it even more baffling.

If you do not have a friend who belongs to the Magic Circle, then **Magic** could put you on the illusory road to stardom. The package contains a booklet, showing the history of magic with some tricks, and all the software you need to produce a show.

When you load the package make sure that you do not have a joystick interface connected to your computer. The rehearsal part of the game will not work if a joystick is connected, although the instruction booklet does not reveal that problem.

You are then asked for a password. The reason for that, so the publisher says, is to stop unauthorised entry to your arcane secrets. The code, however, is so easy to crack that it's laughable and I'm sure you could guess what it is by the time you finish reading this review.

Once through the code you must enter your stage name. I use 'Gilbo' as the computer will only allow you to enter a short name.

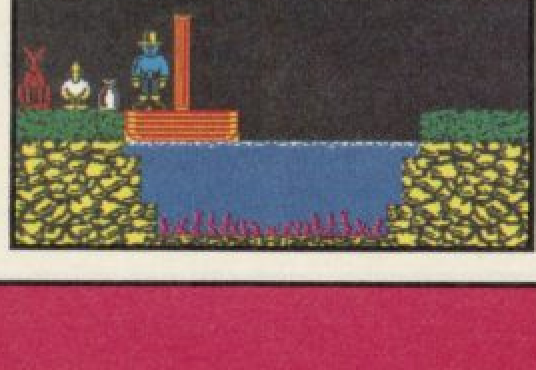
You are then confronted with a screen offering Tricks, Sequence and Show. The first option displays a series of nine tricks including 'Magic Birthday,' 'Think of a Card' and 'Total Bemusement.' First you should view the instructions, then look at the tips for presentation and go to rehearsal.

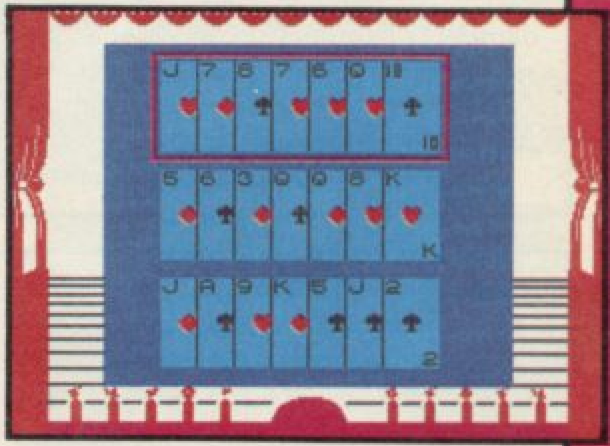
The sequence option on the menu is used to put a show together. All the tricks are listed on a sub-menu together with three pieces of music which can be played between performances.

At last, your chance at stardom arrives. You have practised all the tricks, prepared your patter and rehearsed until your eyes hurt. You press the star key and the computer annouces you: Welcome to the Gilbo Magic Show.

It's le crunch time as the curtain sweeps back and your first trick appears. Your audience sits before the computer as you take them through the first trick. At least you can't drop a clanger by dropping your props.

The applause — you hope — covers the music but you are too keyed up to notice and go on to your next trick.





Soon the show is over, the curtain closes and That's All Folks' appears on the screen.

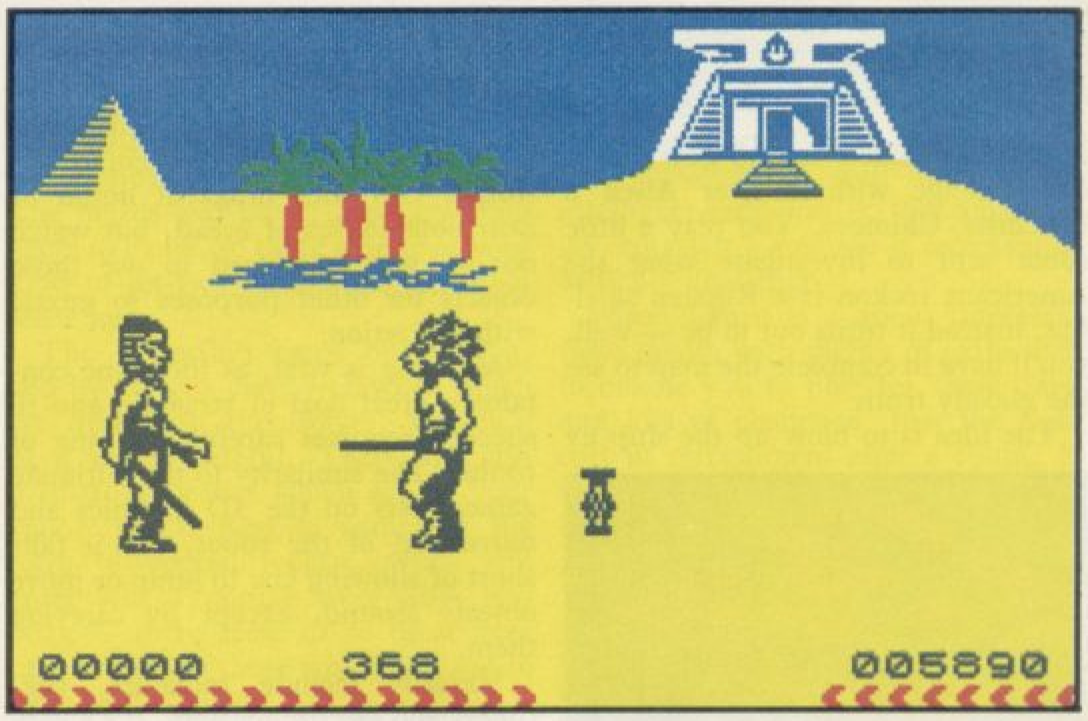
You've either made it or blown it but, either way, you will have enjoyed **Magic.** The tricks incorporated with the package could be presented in a book but the computer has the advantage of allowing you to see the trick performed and to be able to rehearse it in front of an electronic audience.

Although the tricks in the software package are simple and self-working they are just as surprising in their denouement as some of the more difficult illusions shown in the accompanying book. If you are interested in the practical side of magic you will enjoy this offering *John Gilbert*

Publisher Macmillan **Price** £8.95
Memory 48K
★★★★

more software on page 28

Fighting Warrior



THE ORIGINS of karate are part of the history of the mystic Orient, or so we always thought. Melbourne House clearly reckons they go further back to Ancient Egypt, and has brought out **Fighting Warrior** to prove it.

Like the immensely successful **Way of the Exploding Fist**, it is an animated battle game, with you as an Egyptian warrior fighting a series of monstrous opponents by bashing them around the ribs with a large sword.

Similarities with Fist are obvious. The same style of combat is used, but with fewer options. There are essentially only three blows — duck, jump forwards and jump backwards. That makes it rather easier to play, but probably less satisfying in the long run.

The animations are terrific, with a variety of monsters — the winged demon which kicks you in the guts requires quite different tactics to the dog-headed creature whose main defence is to cower on the ground.

Magic bottles appear as you progress — assuming your energy levels last out long enough — which may contain hazards or give you invincible strength. Use them at your peril.

The point of all that is to liberate a princess from the tomb. If you get that far, watch enthralled as the screen displays a welter of spinning mummy bandages in the final scene. We won't spoil the surprise by revealing all, but it's well worth the effort of playing all the way through.

Fighting Warrior is karate for kicks and should appeal to a younger, or possibly less nifty set of fingers than Fist requires. It is good fun, and boasts one of the flashiest title sequences we've seen in a long time. Good solid entertainment, but liable to be eclipsed by its sister program in the charts.

Chris Bourne

Publisher Melbourne House **Price** £7.95
Memory 48K **Joystick** cursor, Kempston, Sinclair
★★★★



10 Pack Volume 2

REJUVENATED after its summer break, Automata celebrates its return with another compilation cassette of 10 games.

There are two illustrated text adventures. The first, **Xtroth** is difficult, but you can ask for help although the cryptic clues can be more mind boggling than the dilemma from which you seek rescue. **Paradise in Microdot** contains some zany humour with verses involving birds in trees, edible wriggly worms and little wriggly knees!

Then there are two maze games. **Pi There** has Rastapiman trapped in a cage being zapped by an evil eye. **The Egg** manages to drag the Tory Party into the story with Tory blue pills to collect and red ones to avoid.

Grab and dodge games make up another four programs. While some have interesting story lines, like hot air balloons, baked beans tins, or toilet cisterns where loo rolls must be collected, they are either slow in response or basic in graphics. Still, the humour seeps into the toilet scene — the text reads 'You can't beat the cistern.'

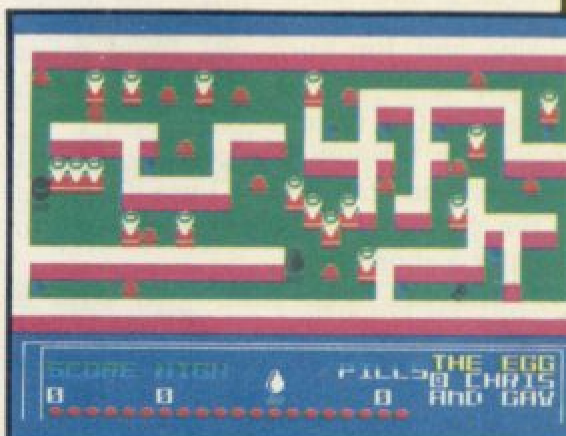
Nudgeit is a fruit machine simulation. The graphics are excellent, there are buttons to nudge, gamble, collect and hold. A further display has sums of money with arrows moving constantly between amounts during play. A large window allows a view of the slots themselves with the signs spinning realistically. You have 15 minutes to make your money.

Finally, **Piman's Cocktail Cabinet** is a list of nearly 200 cocktails complete with their ingredients. It is well laid out and contains some dubious names like Zombie.

The 10 Pack is a pretty mixed selection to cater for all tastes. The cassette comes complete with a £3 money-off voucher against two games, and can be bought only through mail order from Automata. *Colette McDermott*

Publisher Automata
Price £8.00 inc P&P
Memory 48K **Joystick** Kempston
★★★★

more software on page 30



Their Finest Hour

IT'S WIZARD flying weather but we're in for a stormy ride. Goering has despatched the Luftwaffe and it looks as if the Battle of Britain is about to begin.

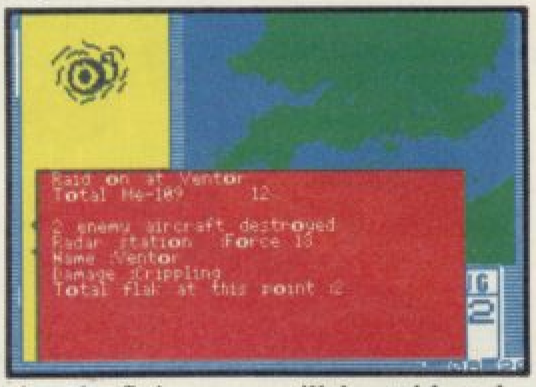
You must take on the task of organising Britain's air power. Churchill will be depending on you and will summon you to his bunker every evening expecting good results. If you lose the battle of the sky you will also lose your job.

Before the start of the game an icon driven menu is provided for the selection of joystick, keyboard and pulse rate. The pulse rate governs the speed at which the game plays and is entered as a number between one and 255. You must choose whether you want to play the one day option or a longer game. One day in the hot seat is best for the beginner who has to juggle with the duty rosters for all air bases in Britain, keep an eye on reports from radar stations and organise the positioning of flak guns.

Only then can you scramble air bases to take action against the enemy as they fly in over the coast.

A map of Britain is displayed and you can zoom in for a detailed look at any of the air bases under your control, by placing a cursor over the area in which it is located and pressing the fire button. An exploded view of the map will appear together with a status report which gives the type and number of aircraft at a base and the feelings of the pilots stationed there.

You can scramble a base by selecting the alarm bell icon. If aircraft are



already flying you will be told so by the base commander but if not he will simply say: "Yes Sir!"

When a confrontation is imminent you will be prompted to enter an Agression Factor ranging from one to six. That determines the ferocity of the fighting and the lengths to which your pilots and gunners will go to drive off the Germans.

After the smoke clears you get a status report from the base commander showing the number of casualties on both sides. A local alert, to bases in the area, combined with a high Aggression Factor is likely to cause severe casualties. Luckily, you can alert all bases on the south coast to aid a beleaguered area. That action, coupled with good flak support and an Aggression Factor of four or five should give the enemy plenty of trouble while keeping allied losses low.



As air crews are likely to get physically and emotionally worn out you will have to keep a fairly strict duty roster to keep them happy. They can reach the end of their tethers in just one day so imagine what a prolonged campaign could do to them.

You do not have to annihilate the Germans in order to win the game. Churchill will commend you for your strategic measures even if you destroy just a few of the enemy but keep them at bay. Winning is difficult but the first time you defeat the German armada you will feel that you have done something worthwhile. You will also feel exhausted.

Their Finest Hour is a strategy simulation which uses the same icon techniques as **The Fourth Protocol**, also from the Century Hutchinson stable. The package contains a booklet describing the war in the air together with a large scale map – everything you require to take you back to 1940.

John Gilbert

Publisher Century Communications
Price £9.95 **Memory** 48K
Joystick Kempston
★★★★★

more software on page 32



Astro-Clone

THE SIEDDABS have returned — yet again — in a game which is a cross between Hewson's **Dragontorc** and that immortal classic **Defender**.

The experience of a team of crack pilots, soldiers and technicians has been distilled into a master image from which a series of clones is run off. Each warrior is a clone of its fellows, sharing the same thoughts, the same reactions and the same desire to defeat the Seiddab menace.

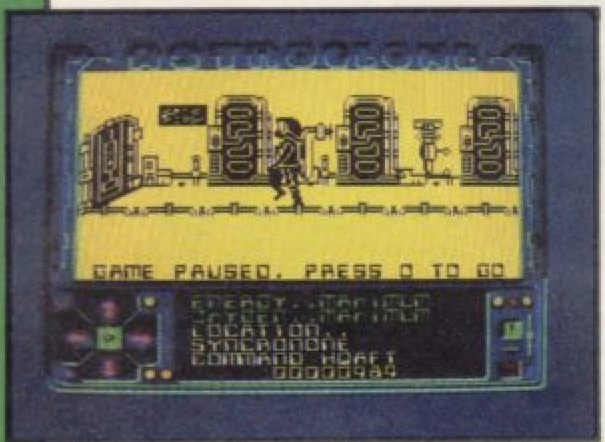
In order to defeat the aliens, who intend to take over the whole of the galaxy, the clones must gain control of all the Stargate sectors of space, dock at the Seiddab supply bases and destroy their main launch computers so that the base will be unable to launch new attack craft. The clones must then de-active the Stargates, through which ships are able to travel to other sectors of the galaxy, and trap all the Seiddabs.

The first phase of the game involves strategically placing your ships throughout the star sectors and purging them of aliens. A map of the sectors comes onto the screen and each sector is represented as a rectangle. Move as many of your ships as you require from the home sector — top left on the screen — across the grid.



Each rectangle displays the number of Seiddabs in that area. Some of those sectors also contain Star bases, but you must find them first.

When you have finished your deployment of forces you must choose a sector and do battle with the aliens in a **Defender**-style game, one of the best we have seen. Not only do you have to destroy the Seiddab battle cruisers but also dodge or destroy waves of asteroids. If a Starbase exists in the sector you must destroy all Seiddabs in the vicinity before docking with it.



After docking, a 3D representation of the interior of you ship — reminiscent of **Dragontorc** — appears and, when you have made sure that your oxygen level is at maximum, you can teleport to the Seiddab base. Once there you should locate more oxygen.

While exploring the labyrinths and rooms you will find objects. To pick those up, press the fire key and the direction icon at the bottom of the screen will display four options — pick up an object, throw it down, put it in your pocket and activate laser weapon.



All objects have a purpose and some of them can be found in strange places. For instance, if you pick up one of the magnetic devices scattered around the base you can collect items which have dropped down shafts protected by grills.

If that was not enough you must also be wary of roving aliens of various shapes and sizes. The most common look like the Zeroids from *Terrahawks*. Many of them are created by the strange mechanical eyes which are placed on the walls of the stations. You must destroy those with your laser gun. After the main computers are destroyed in one station, the game continues with assaults on others.

Astro-Clone is a progression from **Dragontorc** and, naturally, Hewson has been keen to revive the legendary Seiddabs. The 3D graphics are handled well and the icon-driven control panel reacts in a similar way to the spells of **Dragontorc**. *John Gilbert*

Publisher Hewson Consultants
Price £7.95 **Memory** 48K
Joystick Kempston, Sinclair, cursor
★★★★★

Bounty Bob Strikes Back

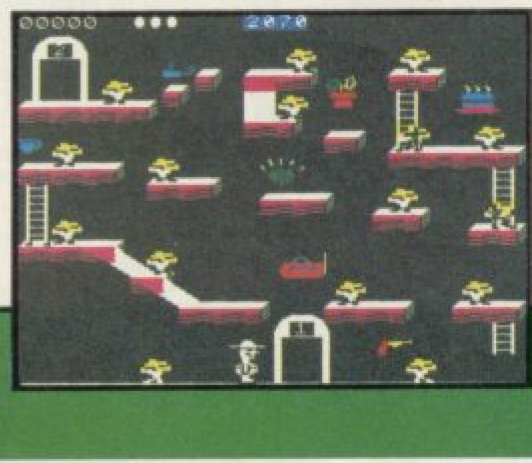
NOPE, this game is not about Maxwell's attempts to gain control of Sinclair Research. It is not even a sequel, though it is billed as one.

According to US Gold, only those of you who are discerning enough to own an Atari computer are likely to have seen the first Bounty Bob game, called **Miner 2049er**. You might have seen one version of it, though, called **Manic Miner**.

Bounty Bob Strikes Back is a levels and ladders game which takes place in a mine full of traps, aliens and acid rain — the author obviously has an affinity with Matthew Smith.

Once you have got over the inventive but not terribly relevant title screen you can guide Bob through a series of cunningly laid out screens. There are 25 in all and at least some attempt has been made to vary the components from which they are constructed.

Bob can move up and down screens in elevators, be pulled through suction tubes, and slip down slides in an attempt to collect objects and score points. You must clear each screen in 2500 seconds or lose a life.



Bounty Bob relies on screen layout to fox players rather than the aliens which are all important in **Manic Miner** and **Jet Set Willy.** It is unfortunate that the character has been introduced onto the Spectrum market so late. Most potential customers are likely to say "Oh no, not another levels and ladders game!" But if that's what you're into you'll enjoy Bounty Bob at least as much as **Jet Set Willy.**

John Gilbert

Publisher US Gold **Price** £7.95
Memory 48K **Joystick** Kempston
★★★

more software on page 34



ocean
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Chinese Patience

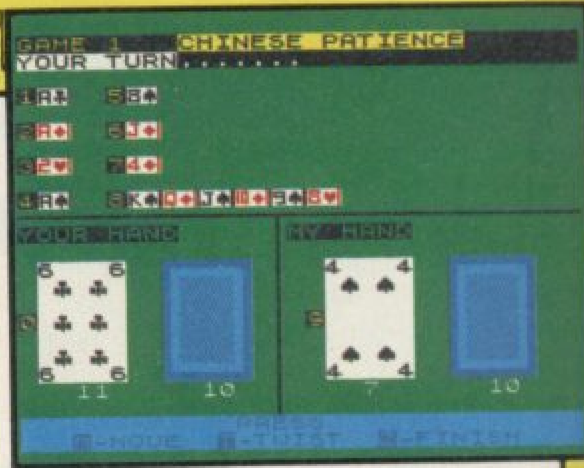
PATIENCE, the solo card game, is usually classed as a non-competitive game. Against an opponent it becomes more a battle of wits. But playing against a computer has to be the ultimate challenge.

The rules involve taking a card from a face-down deck and placing it upon one of eight piles – four piles being filled in ascending order with cards of the same suit, four with descending cards in alternating colours. You can twist – take the next card from the face-down pack – once in a turn or each time you place the previous card. The game concludes when you have run out of cards, or moves.

Chinese Patience sets you against the computer. Players start with an equal number of cards; the winner is the first to get rid of all their cards. The rules are now extended to allow legal dumping of cards on each other's pile.

Taking turns, you progress through the game; both able to see each other's current card and the state of play on the piles. Your interest is maintained throughout the computer's turn as you watch it block your path and you plot revenge.

The graphics, though basic, are clear and well presented. There are a lot of instructions, but those can be quickly grasped while playing. The computer will catch you out on every point at first, but with practice your wits will sharpen and satisfaction is yours when you beat it.



You can choose to play in single games, but it is more fun if you play in matches; the computer keeps the scores, announcing the winner with great zeal.

It is an excellent low priced game which will fill a small gap in the market.

Colette McDermott

Publisher Atlantis Software
Price £1.99 **Memory** 48K
★★★★



Macadam Bumper

FLICK the flippers, flip the floats and tilt onto the triangles as PSS tries to do for computers what Bally and Sega did for pinball machines.

Not only can you play a sample game with three pairs of flippers but you can construct your own table using all the traditional components.

There are two construction modes. The first will alter the existing table and the second will allow you to start from scratch.

When you enter the design phase, the left side of the screen displays each type of component together with a letter of the alphabet. To position a piece on the board just move the cursor to the desired location and press the appropriate letter.

Once you have finished your table, you can save it to tape. Alternatively, you can put a coin in the slot, for five balls, set the number of players and press both flipper controls to set the ball in motion.

As a pinball wizard in my youth the PSS game had much to prove to me. I was not, however, disappointed and quickly notched up a score of 59,660 — not to be sniffed at. The only thing missing is the dull thud and clack as the steel ball is bounced between wood, plastic and metal.

John Gilbert

Publisher PSS **Price** £7.95
Memory 48K
★★★★

Super Brat

THE BRAT struts around the court, psyching himself up. The crowd cheers and the score board announces first service.

Tap! The ball thuds gently into the opposite court and you return it down the side lines, the players moving with all the grace and agility of tortoises.

Deuce. Two advantage points and you win the match. The crowd goes wild in a restrained fashion and your illustrious opponent hurtles his racket to the ground.

There are three championships to win — British, European and World — I wonder what the Brat does when he loses the world championship title to a total unknown? Unfortunately, I didn't have the energy to get that far.

Atlantis cannot be serious. This game is the pits of the world. **Super Brat** is a poor travesty of that wonderful summer sport.

The players only serve forehands, bad ones at that. They cannot move from the baseline and the game is one great struggle to get to the ball. To make matters worse, the Brat hardly gives you time to cross the court before he begins serving.



There is no need for joystick control as only three keys are used. Two to move left and right and one for hitting the ball. A short delay before hitting the ball will take it to the right hand side of the court, no delay takes it to the left. The player is slow to respond to your controls.

The court is probably the best thing in this tedious game. The screen is set out in a 3D representation of a tennis court. The score board, although small, scrolls well and the scoring is quite realistic.

If you want to play tennis, go for Psion's **Match Point**.

Clare Edgely

Publisher Atlantis **Price** £1.99
Memory 48K
★★



ZOIDS
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Bridge Player

BRIDGE is tough to put onto a computer – tougher than chess.

It may be an easier game for humans to play, but the big difference is that in a game of Bridge you can't see all the cards. In chess it's a matter of working through combinations, and the problem is how to analyse millions of combinations very quickly. In bridge it's all about probable distributions of cards, and making a compromise on every play. The strategy must be flexible – you can't work it all out in advance.

Within those limitations, CP Software does well. **Bridge Player** is based on a series of such programs written for other machines, and is the best version of the game we have seen. The computer bids the three non-player hands and plays defending or declaring hands. There are options to replay and rebid hands, the response is extremely fast for a game written mainly in SuperBasic, and the standard of play is moderately dim, but by no means moronic.

The bidding is based on a stunted ACOL system, with strong two club, Stayman and Gerber supported. The program cops out on the latter, and requires you to confirm your use of the convention, rather than interpreting it from the bidding. We found the computer a reliable partner on flat hands, but decidedly wild in ambiguous situations. However, good bidding involves understanding a partner's limitations, and such aberrations need not detract if you don't expect too much to start with.

Play is better, and the computer follows set lines – finesse, cross-ruffs, drawing of trumps and so on – with dogged competence. Its defence is often sharp, and occasionally deceptive. The cards are played very quickly, and the speed tempts you to play equally fast. Beware of hitting the space bar in such situations, which prompts the QL to play for you.

Graphics are clear and professional, with no annoying jingles or slow scrolling of cards all over the screen to distract you. Our one niggle with the presentation is the scoring, which does not tell you when you have won the rubber, but just resets itself.

Bridge Player is a sophisticated version of the game, and not recommended for those who have never played at all. Those who already know something of the game, at whatever level they play, will enjoy the opportunity to play on their own, when there's no opportunity to put together a four.

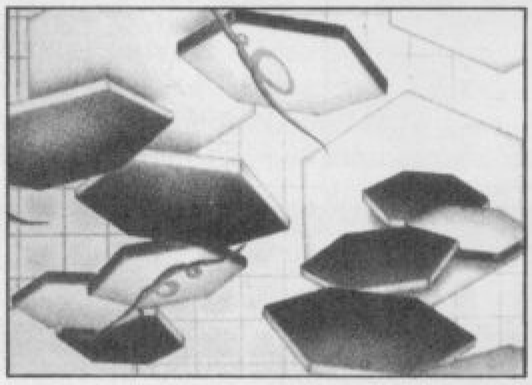
Chris Bourne

Publisher CP Software
Price £18.95
★★★★

QL Reversi

NOW HERE'S a lovely sight — Othello on the QL. There is at least one version already from Softschool, which we panned in September because it was absolutely dire. In fact, there's something pretty dire about putting Othello on any machine these days, let alone the super-magnifico QL, but some nitwit at Sinclair Research clearly had a stroke in the bath one morning and said "what the hell, let's do it anyway."

Now, if you want Othello, this is probably the version to get. It's got nine levels of play, with a response



time of two hours at the highest level. If anybody's into playing Othello by post, they'll love it. There must be at least a dozen sales there, surely.

The game is attractively produced for what it is, and the QL plays competently at the lowest level, and meanly from about level three up. Watch, boggled, as the pieces shunt across the screen when you make a move.

There are also options for a two-person mode, replaying the previous game, and a demo where the QL happily plays itself while you go and do something worthwhile like watching your pirate video of *Rambo* for the thirteenth time.

In fact, it's that last option which represents the real value of the program. It's the ideal present for a bored QL this Christmas.

Chris Bourne

Publisher Sinclair Research
Price £12.95
★★

QL Meteor Storm

A TERRIFIC new arcade-style craze is about to hit QL owners in **Meteor Storm.** Trust Sinclair Research to come up with the game we've all been waiting for — when nobody else dared. When we loaded it up, we were so excited we could hardly bring ourselves to write about it. That's the sort of game it is.

What do you do? Well, there are all these meteors out in space. They look like green polygons, outlines of mysterious shapes — talk about graphics! You have a little spaceship, a red triangle. But that's nothing — when you hit an asteroid it splits into two or three or even four bits. When you clear a screen, you get even more.

The sound effects are equally superb. When you hit the fire button you actually get a noise like a space laser going off, real state-of-the art stuff. It's just like playing a real computer game. And it's not just all shooting at meteors and things — there are rival spacecraft too!

Of course, Sinclair Research isn't releasing this game out of the kindness of its heart, even at such an incredibly low price. I mean let's face it friends, business is business. Clive needs to sell QLs like billy-o and that means getting some really ace software out.

Meteor Storm is just such a game. Honest, when people see this in the shops they'll be down there forking out their life savings for a QL just to be able to play it. Stuff your Ataris and Commode 128s and Amigas and Amstrads and the rest of them. This is where it's at.

Chris Bourne

Publisher Sinclair Research
Price £12.95
Joystick compatible
★

Spectrum Plus Logo

IF YOU HAVE not learnt about the joys of Logo then *Spectrum Plus Logo*, by Tim Hartnell, provides everything you need to get started.

It is not just a book of pretty patterns produced by short listings. Hartnell has produced a version of Logo, close to the LCSI standard which is included in the book. He starts with a brief introduction to turtle graphics and shows how the language can be applied to the real world using a floor turtle to draw mathematical patterns.

The rest of the book deals with how to use Hartnell's Logo-K language, the listing for which is reproduced at the back. Hartnell uses a simple style, in text and listings, but does not miss an opportunity to show that Logo is a fun, as well as being an educational, language.

The example listings may be short — some of them are only three lines in length — but they all produce spectacular results. Starting with a simple recursive flag design Hartnell shows that there is art in the mathematics of angles. By the time you reach the end of the book you will be reproducing patterns to equal spirograph creations and have lost your fear of mathematics.

At £2.99 the book represents excellent value. Although Logo-K is written in Basic and produces turtle graphics slowly it will respond to a large number of commands.

The book is ideal for schools and colleges where it could be used as a general text on Logo and a source for an implementation of the language which students could type into their home machines. Tim Hartnell has come up with an educational winner.

John Gilbert

Publisher Interface, 9-11 Kensington High Street, London W8 5NP
Price £2.99
★★★★★

Useful Home Computing

FOLLOWING his success with *30 Hour Basic* Clive Prigmore has appeared again to torment us with his *30 Hour Useful Home Computing* book.

Prigmore starts by introducing the components of a computer system, including disc drive, printer, monitor and — unlikely as we are to forget it — micro. The perennial subject of ROM and RAM is brought up but the author has kept excitement down with the use of only one simile in that section — and no, he does not use the pigeon hole analogy.

The most informative sections of the book are those on word processing, spreadsheets and databases. Using a non-committal approach Prigmore does his best to show you how to choose software which will suit your needs and provides shallow explanation of how typical packages work. His advice is basic but it is the sort of information which a businessman who does not want to know about computers will need to know.

Interspersed between the general information chapters are sections for those of you who want to know what goes on behind the keyboard. Prigmore distinguishes between the types of data involved in data processing, the types of operating system you can purchase and what type of hardware is available for business computing.

The checklists at the end of each chapter will help you remember what was covered in the proceeding text but if you expect the book to be as useful as Prigmore's *30 Hour Basic* you will be disappointed. *John Gilbert*

Publishers Century Communications, 62-65 Chandos Place, London WC2N 4NW **Price** £8.95
★★

The Robot Book

THE POPULAR image of the robot, as seen on television and portrayed in books, has changed only slightly in the past 20 years.

Much fiction has been written about robots which talk, perform complicated actions and even rule the world, but few non-fiction books have found their way onto the market. *The Robot Book*, by Richard Pawson, puts that oversight right.

Pawson has divided the book into four parts covering the history of robots, robots in action, how they work, and a section on how to build robotic devices. Each section is lavishly illustrated.

The section explaining how robots work is the most interesting. It starts with a brief look at the main parts of an automaton, such as its synthetic senses, movable parts and motors. Pawson then goes on to show the types of robot available. Those include industrial and laboratory devices, domestic 'helpers' and toys.

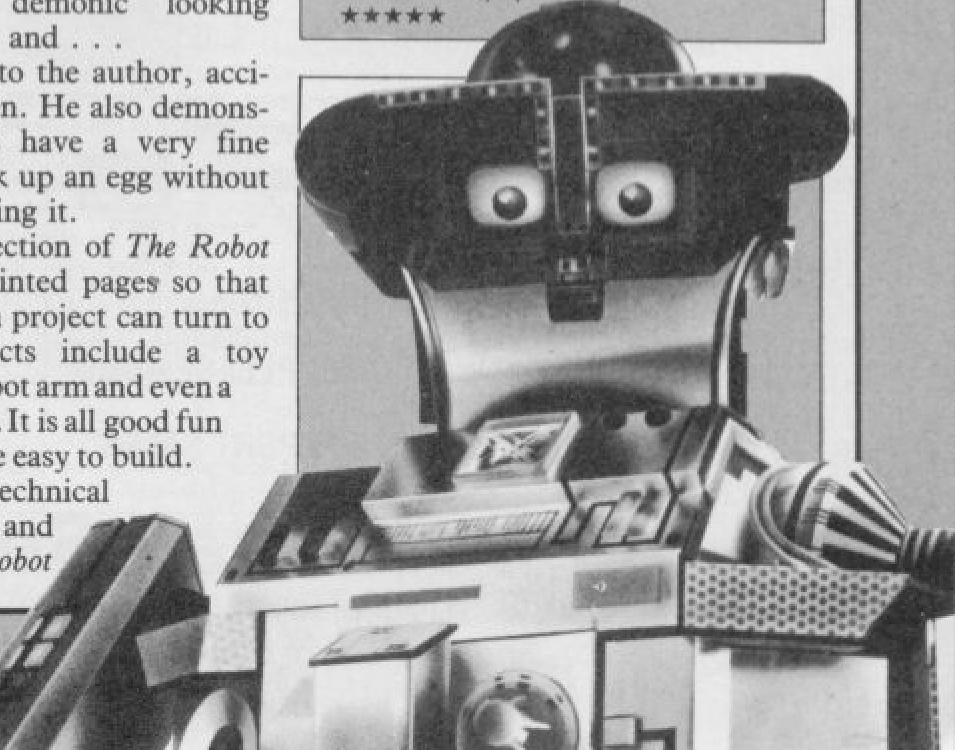
Some of the uses to which robots are put seem dangerous. The book contains a picture of a sheep being sheared by a demonic looking machine. One slip and . . .

But, according to the author, accidents rarely happen. He also demonstrates that robots have a very fine touch and can pick up an egg without dropping or cracking it.

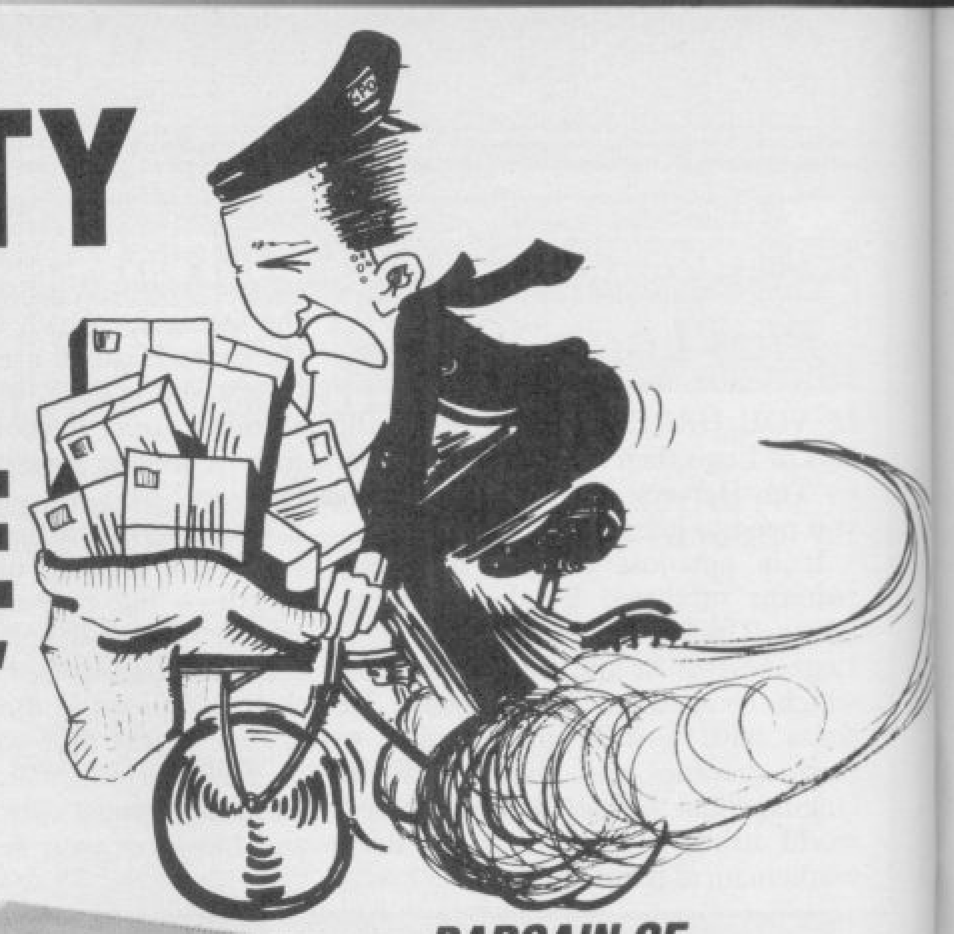
The practical section of *The Robot Book* has yellow tinted pages so that anyone following a project can turn to it quickly. Projects include a toy android, a Lego robot arm and even a card-dealing robot. It is all good fun and the projects are easy to build.

If you like the technical side of computers and robots then *The Robot Book* will prove entertaining reading. I cannot even complain about the price which is surprisingly low for a publication of such quality. *John Gilbert*

Publisher Windward, WHS Distributors, St John's House, East Street, Leicestershire, LE1 6NE
Price £7.95 (paperback)
★★★★★



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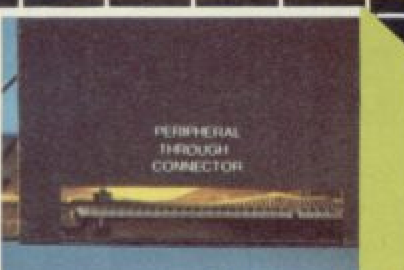
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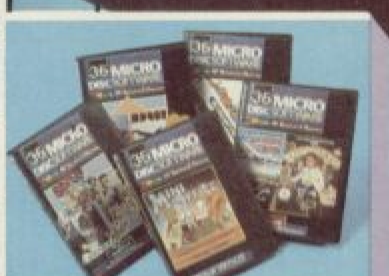
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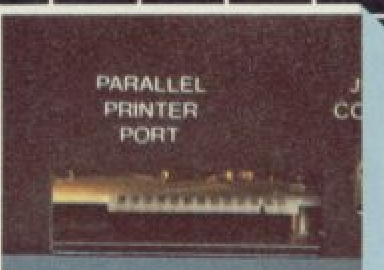
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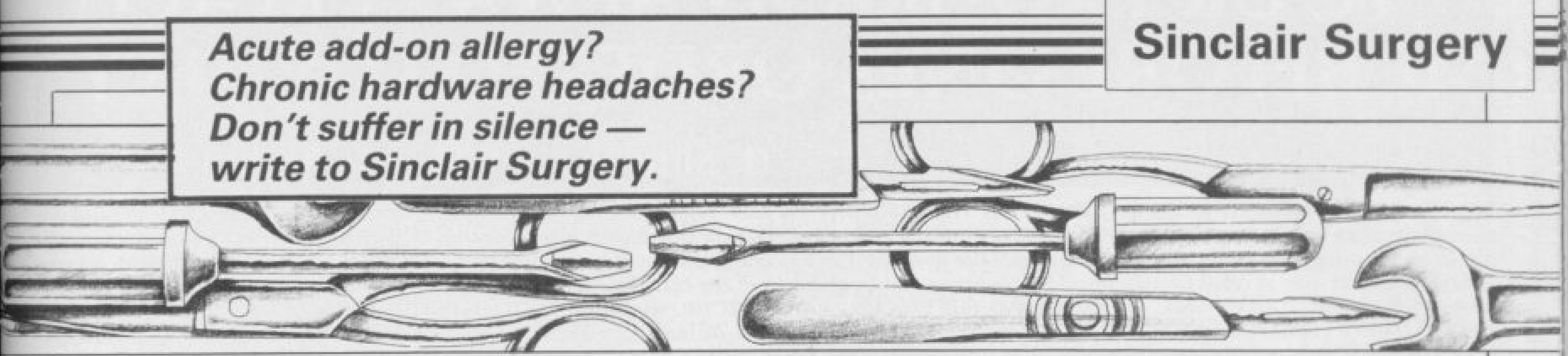
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Acute add-on allergy? Chronic hardware headaches? Don't suffer in silence — write to Sinclair Surgery.



Brothers make a connection

WHILE reading the June issue I came across a letter by Dave Postance concerning his fruitless efforts to motivate his Brother M-1009.

Firstly, Dave says he has trouble getting hold of the RS232 connecting lead. I got my printer from Boots, and the RS232 lead came with it. I also obtained a copy of the correct settings for the internal switches from the salesman, and they are as follows:

Switch 1 — (1,2,6,7,8) off, (3,4,5) on.

Switch 2 — (2,4,5,7) off, (1,3,6,8) on.

As for not being able to get the printer to work, I hope he didn't make the same mistake I did, which was to forget to use the format command.

Andrew Beagle, Darlington, County Durham

Definitive compatibility

I WOULD like to purchase a joystick and interface, and I am a bit confused. When an interface is described as Kempston compatible, does it mean that it is compatible with a Kempston joystick, or a game which uses Kempston?

Karl McAteer, Dublin, Ireland

● *The Kempston standard is a hardware and software convention to connect a standard joystick to the Spectrum. It was invented by Kempston MicroElectronics back in the early days of the Spectrum and has been adopted by other manufacturers.*

If a Joystick interface is Kempston compatible it means that it can be used with any joystick, not only those from Kempston, and will respond to software which has a Kempston joystick option.

To read a Kempston compatible interface use IN 31. The following bits will be set when the stick is moved; 0 — Right; 1 — Left; 2 — Down; 3 — Up and 4 — Fire. Therefore, if the stick is pointing up and right with the fire button pressed you would get the number BIN 00011001, or 25 in decimal.

The mysteries of the modem

IN THE April issue you reviewed the Miracle Technology WS2000 modem. Could I use that modem with the RS232 interface included in Interface 1 and is software available to do that?

Gerard Markey, Belfast

● *The WS2000 modem will not work with Interface 1, and due to the way Interface 1 is made it is unlikely that any modem will ever be made to work with it.*

Machine code without tears

IS THERE a program on the market to translate Basic programs into machine code? Where might I buy such a program?

Tormod Guldvog, Norway

● *To convert Basic to machine code you will need a compiler.* **Blast!** *from Oxford Computer Systems, Hensington Road, Woodstock, Oxford OX7 1JR (Tel: 0993-812700) should do the trick. It costs £24.95.*

Sinclair is house-trained

I AM interested in using my Spectrum to control domestic appliances and other, rather more simple, output devices. Can you recommend a suitable interface? I am thinking along the lines of the Indescomp Domestic controller or the Datel Robotek.

Roger Cape, Angus, Scotland

● *Interfacing to the Spectrum is a complex subject which needs many pages to cover in depth. Both the Indescomp controller and the Datel Robotek are suitable devices for simple I/O but I would suggest that you have a look at* 20 Simple Electronics Projects for the ZX81 and Spectrum *by Stephen Adams, published by Interface Publications, priced £6.45. That contains many useful projects and would give you a better idea of what you will need.*

Secret life of the hacker

I AM a would-be hacker and I own a Spectrum 48K, a VTX5000 Modem and a BT phone.

Unfortunately I am unable to get anywhere as when the modem is connected up Micronet 800 automatically appears.

Can you tell me what additional peripherals I need to get going. Is an RS232 Port necessary, for example?

Mark Lambert, Birkenhead

● *For more information try* The Hackers Handbook, *Longman Publishing, priced £5.95, or* The Hackers Handbook, *Century Communications, priced £3.95.*

Major crash in Cambridge

I BOUGHT a microdrive and Interface 1. I already own a Cambridge programmable joystick interface.

It seems that the Interface doesn't work when the microdrive and Interface 1 are connected — the tape loads and then after programming the keys the program crashes. The interface works well when Interface 1 is not connected.

I also found that the Quickshot 2 joystick makes the Cambridge interface act strangely when the program asks you to test the joystick keys. The joystick keeps on firing even when the auto-fire is off.

Quresh Mohamed, Stockport

● *Nidd Valley Products — Freepost, Knaresborough, North Yorkshire HG5 8YT (Tel: 0423-864488) — have bought all old stocks of the Cambridge Computing joystick interface and can supply you with a new copy of the software which will work when Interface 1 is connected.*

Driving with the Cumana

I HAVE seen an advertisement for the Cumana drive, compatible with microdrive and Interface 1, for the Spectrum.

Can you tell me your opinion of this drive?

Maurice Metais, Veneuil, France

● *The disc interface sold by Cumana is actually the Beta from Technology Research. The new Beta Plus — reviewed in the October issue — is a very good interface and can be recommended.*

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POPEYE

"Characters who are almost half the screen tall boast solid colour and avoid most attribute problems. It's all very much like watching a cartoon film." (PCW) "The large characters work well and are animated beautifully, particularly their faces ... incredibly addictive game." (CGamer) "Brilliant! Buy it to believe it." (Crash) Sticks OK. (DK'Tronics) **Cassette £6.95**

ARNHEM

"One of the best computer wargames I have yet seen. Visually, it's very attractive indeed." (PCW) "Probably the best wargame on the Spectrum." (YrComp) "Certainly the best wargame I've seen on the Amstrad. Display and scrolling are both impressive." (AmsAction) For 1 to 3 players. Choose from 5 different scenarios, lasting from 1 to 8 hours in realtime. No Stick. (CCS) **Cassette £8.95**

Nick Faldo's Open

*"I loved it, this is definitely the golfing simulation to buy ... all the trappings of animation, scrolling screens and icons and it's great!" (PCW) "One of the prettiest and friendliest golf games we have seen ... with stunning 900-screen map." (SUsr) "A great simulation and suitable for non-golfers, too." (Crash)*16-page manual with Nick Faldo's hole-by-hole guide. Sticks OK. (Mind Games) **Cassette £9.95**

MONOPOLY

"An excellent simulation ... vastly superior to the other, non-authorised versions ... the graphics are very realistic." (HCW) New Official Monopoly, with 3D board view; for 2 to 6 players any or all of whom may be the computer. Specify length of game if you wish. No Stick. (Leisure Genius) **Cassette £9.95**

ANIMATED STRIP POKER

"Even without the strip feature, this game would still be very compulsive ... the scene where the girl removes her dress is very well done ... the movements are all natural and the effect is quite convincing."(AmUsr) "I have to admit the game did make my palms sweat ... but it would stand up on its own for the poker alone." (ZXComp) Very well-animated game of 5-card draw poker with some of the biggest graphics you have seen. No Stick. (Knightsoft) **Cassette £6.95**

HACKER'S HANDBOOK

"The ethics aside, a very good read ... clear and uncomplicated ... Well worth buying." (ZXComp) Takes you from the first steps, how a modem works, what equipment you need, through to dialling publicly listed computers. Shortwave radio hacking, too. Amazing, really. Century Paperback, 150 pages. Order as **'Hackbook'. £4.95**

ROBIN OF SHERWOOD

"I found the scenario compelling and the identification with Robin very easy given the fine graphics. I thoroughly recommend 'Robin' to all potential freedom-fighters." Star in this graphic adventure as Robin Hood. Coded help in the instructions gets you into the adventure fast. Hint sheet available, too. Plus Help and Save. No Stick. (Adventure Int'l) **Cassette £9.95**

ROCKY HORROR SHOW

"Looks good, sounds good, and is very addictive, just like the show itself." (C&VG) Be Brad or Janet and explore the mansion. Very funny arcade adventure. Great music and movement. Sticks OK. (CRL) **Cassette £8.95**

EXPLODING FIST

"Karate should be a sure-fire winner when portrayed as realistically as in this superb simulation. The movement of the fighters is very realistic ... virtually beyond criticism, technically brilliant and visually absorbing." (PersCompWorld) "Each animated figure is a joy to see. Movement is fast, smooth and realistic ... just wonderful." (C&VG) For 1 or 2 players as they progress from novice to Tenth Dan. Over 700 sprites used for each fighter! 18 manoeuvres to learn. Instructions in French and German, too! Sticks OK. (Melbourne House) **Cassette £8.95**

NATO ALERT

A wargame simulating a non-nuclear conflict in Europe between NATO and Warsaw Pact forces. 1 or 2 players, 5 skill levels. Up to 21 different objectives may be chosen, to determine length of play. Complex, horrifyingly realistic. Map graphics help. Hints given, too. No Stick. (CCS) **Cassette £5.95**

The ARTIST

"Who needs a Macintosh when you've got a Speccy and this program? It's features are powerful and easy to use. There are on-screen commands and a very fast and flexible FILL command and even a cut-and-paste facility. All it needs is a mouse and you've just saved yourself two grand ... If I was asked to pin down the best program on its UDG handling alone, I'd plump for the Artist." (YrSp) Claimed to be 'the most powerful and flexible graphics program available for the Spectrum.' Wafadrive/Microdrive/Discovery 1 compatible. SofTechnics will provide colour dumps of your pictures, too! Sticks OK. (SofTechnics) **Cassette £12.95**

BORED OF THE RINGS

"An excellent and vast parody... I would rather spend months unravelling 'Bored' than days on a self-important 'serious' epic ... Challenging and atmospherically written." (PCW) Enhanced version of this huge, funny, beautifully graphical adventure spoof loads in 4 parts. No Stick. (Silversoft) **CASSETTE £6.95**

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Signature: .... Expiry Date ....

Please write clearly. If we can't read it, you won't get it.

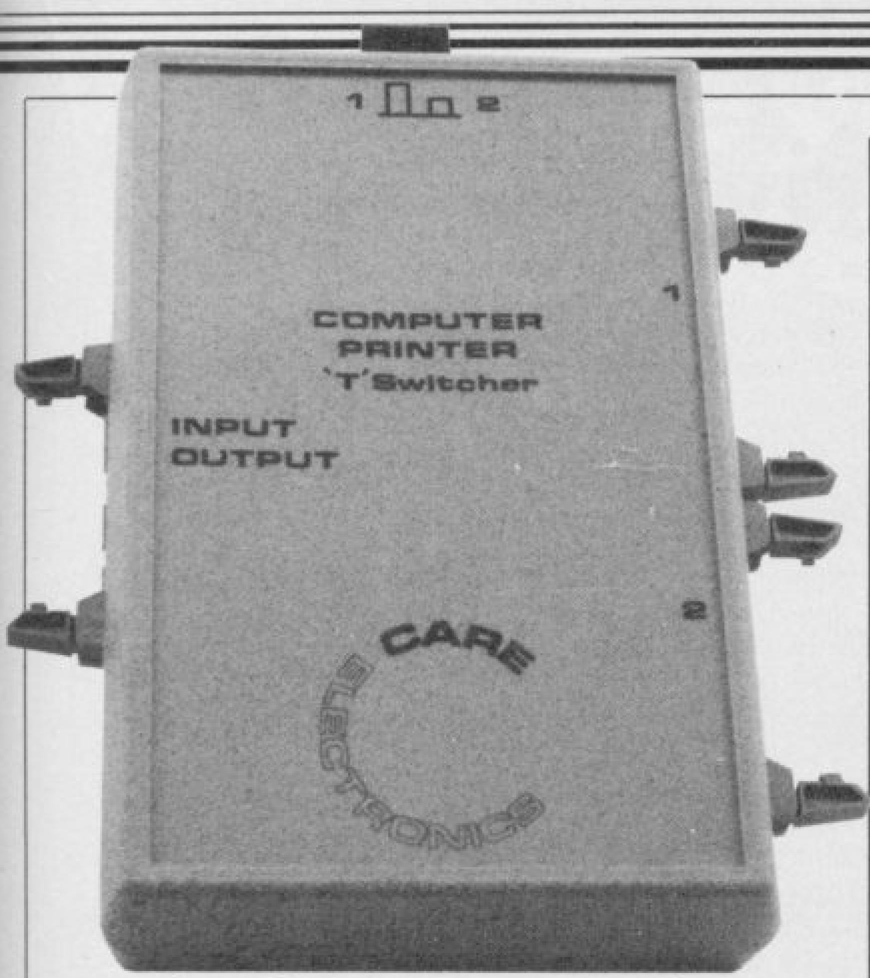
Name: ....

Address: ....

.... Postcode: ....

PHONE NO: if any, in case of query ....

Program Name	Price
Postage & Packing — UK add 75p per order	
Europe ADD £1.00 per program	
Outside Europe ADD £1.50 per program	
Total Order	



Diskography

IF YOU ARE someone who is forever plugging and unplugging things into your computer you will probably be aware of how quickly plugs and sockets can wear out. Usually the thing to do is to use some form of switching device, but those tend to be horrendously expensive.

Care Electronics has released a two-way printer switcher for the modest sum of £32.20 plus £2.00 p&p. It can be used to connect two computers to one printer, or vice versa.

Although originally designed for the BBC, it works well with Spectrum printer interfaces, but we found that it refuses to operate with either the Medic or Technology Research QL interfaces. As so many combinations of computers and printers are possible you would have to experiment with your own equipment.

Care Electronics Ltd, Unit 14, Peerglow Industrial Estate, Old's Approach, Tolpits Lane, Watford, Hertfordshire. Tel: 0923 777155.

System switch

THE NEW Kempston disc interface, a development of the Watford SPDOS, is one of the fastest interfaces we have seen for the Spectrum and it has some useful features.

Reliability proved to be a problem as the interface refused to work with either our own drives — used on all other Spectrum disc interfaces — or the Opus drive. That problem was eventually identified after trying three interfaces, and subsequent units should not suffer the same fate. If possible, either check with your own drive or buy the combined interface/disc drive package from Kempston. The interface was subjected to one of the longest tests we have ever given and it passed with flying colours.

At its simplest level, you can use the interface as you would a tape deck, to load or save a Basic program, Code or Data. You use the same commands as you would for tape but precede them by PRINT £4.

One useful byproduct of the system is that you can open channel three to a file on the disc. That means as this channel normally points to the ZX Printer, you can LPRINT to the disc and then later print out the file.

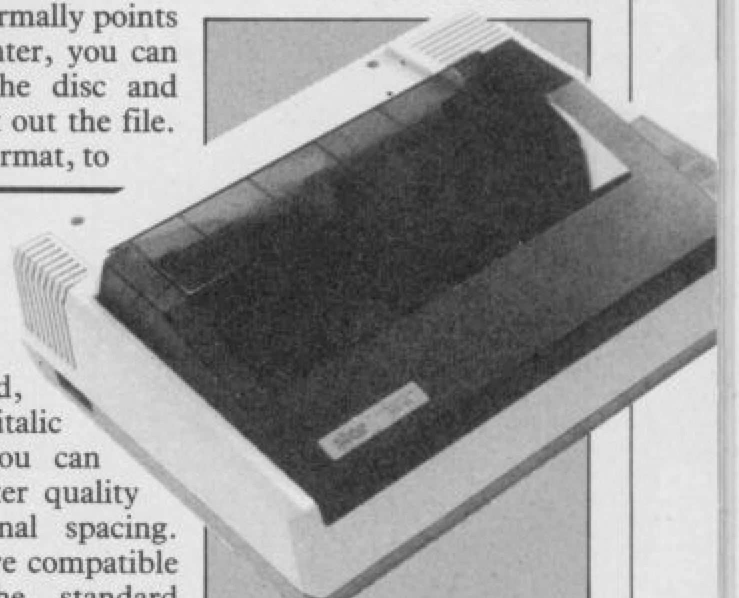
As well as Format, to initialise the disc, the usual Cat (display what is on the disc), Erase (delete a file from the disc) and Move (a file from one disc to another) are provided. They allow the use of wild-cards.

The interface has a number of extensions to Sinclair Basic. Clear can be used in two ways: Clear 0 will look through a Basic program and change all numbers to VAL"number", which saves three bytes per number. It also changes zero to NOT PI, one to SGN PI and three to INT PI which saves five bytes a time. On **Tasword** that saves about 1200 bytes, more than enough to offset the 703 bytes taken up by the interface.

The Kempston interface provides a fast and usable system. Provided Kempston can ensure the interface will work with a wide range of drives it should do well.

The interface alone costs £85, and a system including a 40-track drive is £185, both inclusive. It is not compatible with Interface 1.

Kempston MicroElectronics, Singer Way, Kempston, Bedfordshire MK42 7AW. Tel: 0234-856633.



Star quality printers

STAR HAS launched two new printer ranges, which, at the bottom end of the range, offer exceptional features at a reasonable price.

The SG10 is an 80 column 120 characters per second printer with a built-in 2K buffer, at a recommended price of £259. The SD10 has the same features as the SG10 but runs at 160cps, and costs £389.



The SG10 uses a typewriter ribbon and has an adequate printing mechanism. The SD10 uses a ribbon cassette and is capable of very good quality print.

What raises these printers above the standard of the Epson is the wide range of print styles produced. As well as enlarged, condensed, italic and so on, you can select near letter quality and proportional spacing. The printers are compatible with both the standard Epson and IBM commands.

On the face of it both the printers are good value, but the SG10 at £259 has the edge. The SD10 is fast but that is its only advantage over the SG10.

Star Micronics UK Ltd, Craven House, 40 Uxbridge Road, Ealing, London W5. Tel: 01-840 1800.

Disc drives arrive

ONE MAJOR drawback of the QL is that you can only plug one thing into the user port on the lefthand end of the machine at a time. If you want to add RAM, a disc interface or possibly a printer interface at the same time you have to buy an adaptor at £70 upwards. The Medic Datasystems QL Expansion system overcomes that by combining all three into one box.

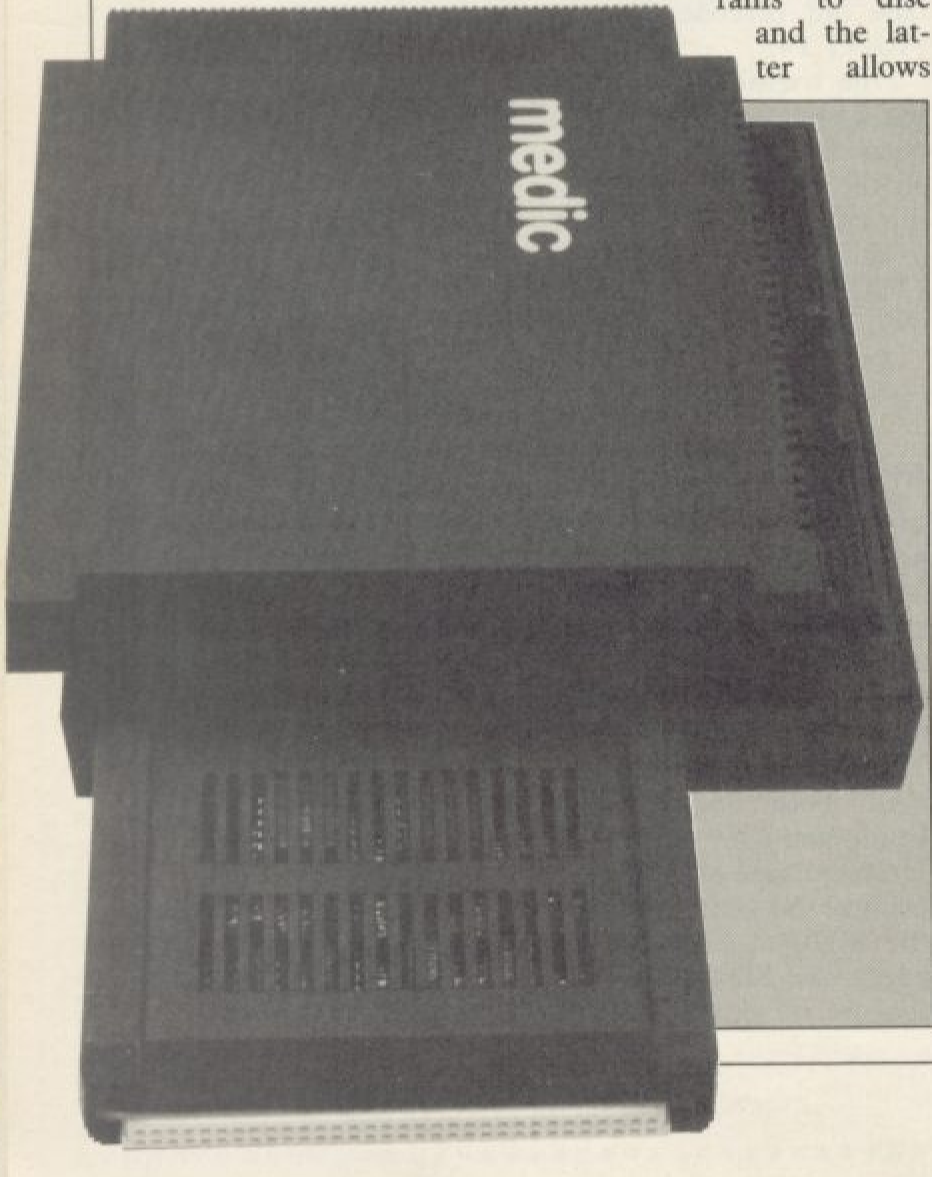
That still presents a problem as the QL provides very little power to the user port. The Expansion system, however, is available in two packages. The first combines disc and printer interfaces and contains 256K of RAM, the second is a disc drive and expansion box which, with the drive providing extra power, can accommodate up to 512K of RAM.

The system provides the facility to create RAM discs and set up a printer buffer, and is supplied with a number of utilities on disc. At present Medic is still not supplying all the currently advertised programs but upgrades will be supplied free as they become available.

The most remarkable feature is the price. The expansion box with memory (256K) is only £129.95, and drive/box prices, without memory, start at £199.95. In view of recent adverse publicity, most of it justified, about delays in supplying systems, Medic is now offering cash on delivery so you don't have to pay until the system arrives.

On the system disc at present are three of the nine advertised programs, M_BOOT, M_KEY and M_TRANSFER plus M_COPY and M_SWITCH.

The most useful programs, if you have additional RAM, are M_TRANSFER and M_SWITCH. The first copies the Psion programs to disc and the latter allows you to have, memory permitting, all four in the QL at the same time. You can switch between them at will; it takes less time to switch than the QL does to redraw the screen.



The beauty of all the programs is that they provide an enclosed environment where everything you need to do is accomplished by single key presses. When the other programs are available they will also be integrated and will provide the icing on what is already a pretty fancy cake.

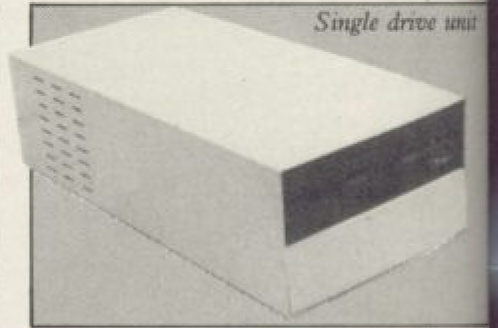
The disc drive(s) supplied with the system are 3½in and include their own power supply. Unlike most other drives they are housed above the power supply which, although they get a little warm, allows you to put them behind the QL and still be able to reach the bottom drive.

Medic has set out to produce a system which out performs all other systems at a competitive price, and has succeeded.

Now Medic has started shipping and, with the COD deal perhaps it will be able to restore its reputation. If you are in doubt you could order by credit card or pick up a system at the next Microfair.

Five packages are available; box including 256K £129.95; box plus one 1Mb £199.95, or with 512K £349.95; and box plus two 1Mb drives £329.95, or with 512K £449.95. New products recently announced, and due to be released in October are the 5Mb hard disc, including interface £299.95; replacement keyboard £29.95; and separate numeric pad £29.95. The modem will be £120.00.

Medic Datsystems Ltd, 76 Grainger Close, Basingstoke, Hampshire RG22 4EA. Tel: 0256-460092

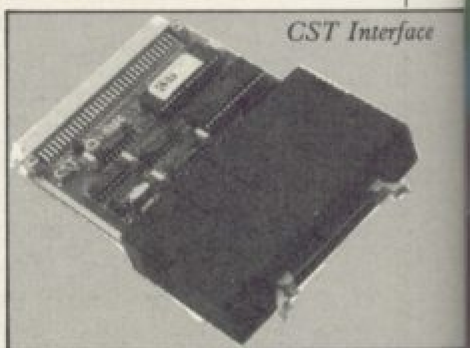


Single drive unit

Double sided magnum Opus

THE QL disc market is hotting up and prices are tumbling. Opus has just announced a package of a CST interface and an 80-track, double-sided, switchable drive for only £249.95. A package with dual drives is £349.95.

Either 5¼ or 3½in drives are available and you can order the items separately at £89.95 for the interface, £179.95 for a single drive and £299.95 for the dual unit.



CST Interface

The CST interface supplied with the drive contains the latest version software, 1.10. If you already have a CST interface the main difference between it and earlier versions are that the sector read commands are now the standard Tony Tebby versions.

Most other packages advertised at a similar price offer only single-sided drives, and so this package, coupled with a two year warranty on the drives, is particularly inviting. The CST interface should ensure Opus a niche in this competitive market.

Opus Supplies Ltd, 55 Ormside Way, Holmethorpe Industrial Estate, Redhill, Surrey. Tel: 0737 65080.



Four great new add-ons from Ram, Number One in everything for the Spectrum...

TURBO INTERFACE

Outperforms any other Spectrum interface. Supports Kempston, Protek, Interface 2 and ROM cartridge software, with a full expansion bus at the rear. The Turbo works with two standard joysticks, making the most of the Quickshot II's rapid-fire action. Features a unique built-in power safety device. Amazing value at £22.95.

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Boost your 16K Spectrum to a full 48K, allowing you to run all the latest and greatest software. Only £21.95

Where can you get your hands on Ram's amazing Spectrum add-ons? You can see them at branches of Boots, Menzies, Greens, Spectrum Group computer centres, and good computer stores everywhere.

Ram Electronics (Fleet) Ltd (Dept SU), 106 Fleet Road, Fleet, Hampshire GU13 8PA.
***Credit Card hot line:** 02514 25252. (Access & Visa).*

Please send me ____ Spectrum Turbo Interface(s) at £22.95.
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Ram Electronics (Fleet) Ltd
(Dept *SU*), 106 Fleet Road,
Fleet, Hampshire GU13 8PA.

Trade and Export enquiries welcome.



Since the dawn of the computer age the prices of home computers have been steadily falling.

But, remarkably, the price of a genuine, full-blooded disk drive has remained almost constant.

Constantly expensive.

You'll be lucky to pick up a decent one for less than £200 in the shops.

Now, however, you can have one delivered to your doorstep for only £119.95 (including VAT and postage and packing).

The new Triton Quick Disk from Radofin.

Its specifications are every bit the equal of a £200 disk drive, as a glance at our card above will confirm.

Quick Disk uses the very latest technology to store up to 100K on high quality Hitachi Maxell double-sided 2.8" disks.

Its disk operating system (DOS) uses standard commands so it is truly easy to use, as any computer novice will be glad to hear.

While the price will be compatible with most wallets, there is a Triton Quick Disk compatible with most computers – Commodore 64, Spectrum (16K, 48K and Spectrum plus), Aquarius, Dragon 64 and all MSX Systems.

And, naturally, included is an interface box plus all connecting cables and instructions.

In short, what we deliver is a complete, genuine disk drive. Not a tape or wafer in sight. All for only £119.95.

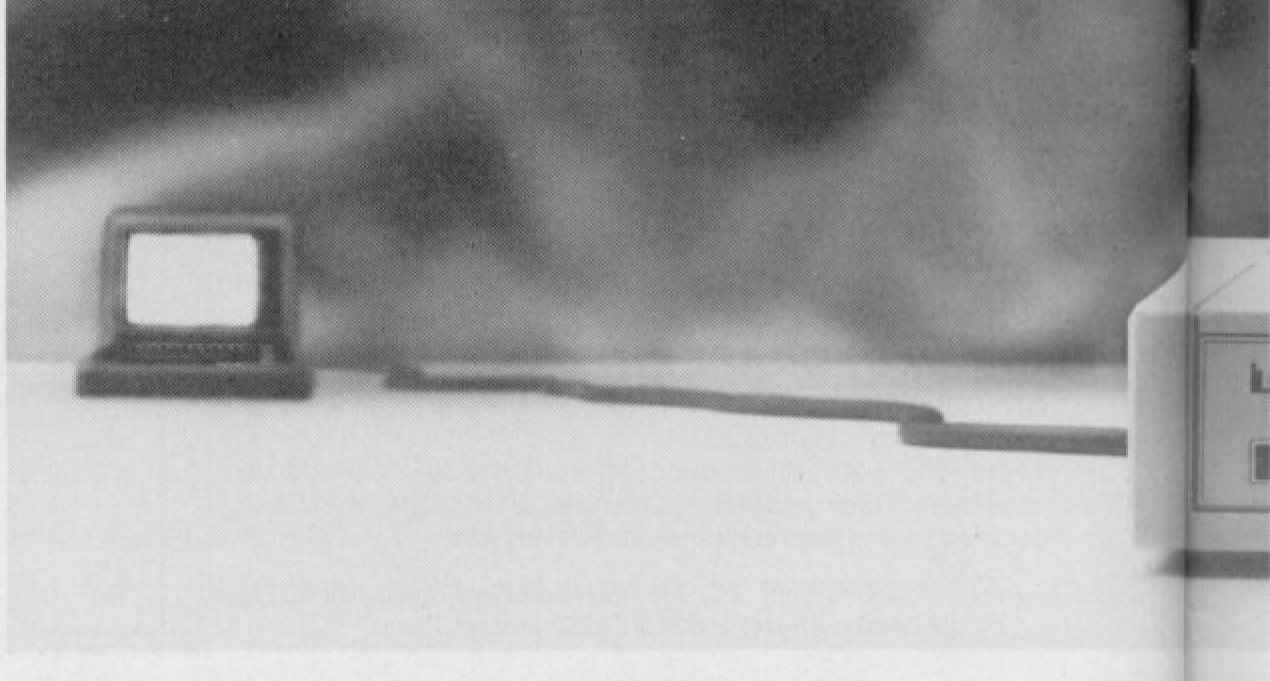
And when it comes to speed of loading, the Triton Quick Disk more than lives up to its name.

FROM 0 TO READY IN 7 SECONDS.

To put the Triton Quick Drive through its paces we used an ordinary computer game – Jet Set Willy.

From tape it took 170 seconds to load.

When loaded from the Triton Quick Disk it took a mere seven seconds. That is 163 seconds less than the tape and certainly as quick as most disk drives on the market.



UM USER YOU'LL
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Proof indeed that the Triton has all the capabilities of its more expensive rivals.

AS TEST DRIVEN BY THE EXPERTS.

New it may be, but the Triton Quick Disk is already receiving rave reviews in the computer press. For example, in a recent Home Computing Weekly article it picked up their much coveted "Flipped" award.

As their journalist said ".... I am very impressed by the Quick Disk. Not only is it very quick, and both smaller and neater than other drives, but it's easier to use as well...the Quick Drive performed faultlessly.

It's easy to use and at around £120 is probably the best buy for the first time user."

High praise indeed for any disk drive.

For one costing £80 less than any comparable piece of equipment it's exceptional.

HOW TO BUY YOUR TRITON QUICK DISK.

As yet you won't find the Triton Disk Drive in any shop. You can only lay your hands on one by filling in the coupon below.

Send it, along with a cheque or P/O for £119.95 to, Radofin Electronics (UK) Ltd., Hyde House, The Hyde, London NW9 6LG. (Postage free in the UK. Add additional postage for outside the UK.)

In the unlikely event of you being in any way dissatisfied, simply return the disk drive and we'll happily return your money.

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Please send me a Triton Quick Disk for £119.95.

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Please include______ 2.8" Diskettes at £2.99 each.

I enclose a cheque/postal order for

Total__________

Make cheques payable to:– Radofin Electronics (UK) Ltd., and post to us at Hyde House, The Hyde, London NW9 6LG. Tel: 01-205 0044.

Name__________

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Tel No.__________

Please allow 28 days for delivery.

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Mission for area control

Create a Scramble type display in machine code with Marcus Jeffrey to interpret the scroll

THERE ARE a few instructions which place the Z80 in a class of its own amongst the 8-bit chips. Those are the block data transfer and search instructions.

A single assembly language instruction can do an enormous amount of work, as shown by this month's program, which moves large areas of the screen to produce a **Scramble**-like display.

We have already used one or two of those in past programs, but never explained how they work. If we look back to the programs which used the alternative screen, we will find they have the following sort of structure:

```
LD HL, from_screen_start_address
LD DE, to_screen_start_address
LD BC, number_of_screen_bytes
LDIR
```

Simple logic tells us that, for the routine to work, the LDIR instruction must cleverly copy all the bytes of the 'from_screen' to the 'to_screen', but how does it do that? The slightly simpler LDI instruction copies the data from the location addressed by the HL register pair to the location adressed by the DE register pair. It then increments both the DE and HL registers, and decrements the BC register pair. So, if we were to execute the following code,

```
LD BC,54321
LD DE,12345
LD HL,23456
LD (HL),99
LDI
```

the registers and locations would have the values

```
BC = 54320
DE = 12346
HL = 23457
(23456) = 99
(12345) = 99
```

That is an interesting instruction but its use tends to be limited.

The LDIR instruction, on the other hand, is very useful. It performs the same operation as LDI, but will continue to transfer data items — incrementing DE and HL each time — until the BC register pair reaches zero. You should now be able to see how the screen copier works.

There are many other uses for LDIR. Suppose that you had a machine code program in memory at location 60000, and found that you had run out of room at the top of memory. An easy solution would be to CLEAR 49999, then execute the following routine

```
LD HL,60000
LD DE,50000
LD BC,number_bytes
LDIR
```

The only remaining job is to modify any absolute locations in the code. Alternatively, you may want to set a number of bytes in memory to the same value. That could be used to set a number of screen bytes to a particular pattern, or to initialise a table of bytes prior to processing. The easy

Figure 1

```
                           ORG     60000
                           LOAD    60000
EA60  3E01      SCROLL     LD      A,1           ;Scroll top third of screen
EA62  CD70EA               CALL    LEFT          ;  one character left
EA65  3E02                 LD      A,2           ;Scroll middle of screen
EA67  CD9DEA               CALL    RIGHT         ;  one character right
EA6A  3E03                 LD      A,3           ;Scroll bottom of screen
EA6C  CD70EA               CALL    LEFT          ;  one character left
EA6F  C9        RET

EA70  FE01      LEFT       CP      1             ;If A = 1, then set HL
EA72  2005                 JR      NZ,LNOTOP     ;  for top of screen
EA74  21E13F               LD      HL,3FE1H
EA77  180F                 JR      LTSCR
EA79  FE02      LNOTOP     CP      2             ;If A = 2, then set HL
EA7B  2005                 JR      NZ,LNOMID     ;  for middle of screen
EA7D  21E147               LD      HL,47E1H
EA80  1806                 JR      LTSCR
EA82  FE03      LNOMID     CP      3             ;If A = 3, then set HL
EA84  C0                   RET     NZ            ;  for bottom of screen
EA85  21E14F               LD      HL,4FE1H
EA88  0640      LTSCR      LD      B,64          ;B = 64 pixel lines
EA8A  C5        LLOOP      PUSH    BC
EA8B  012000               LD      BC,32         ;BC = 32 bytes per line
EA8E  09                   ADD     HL,BC
EA8F  0D                   DEC     C             ;BC = 31 LDIR loops
EA90  54                   LD      D,H
EA91  5D                   LD      E,L
EA92  1D                   DEC     E             ;DE = HL - 1
EA93  E5                   PUSH    HL
EA94  1A                   LD      A,(DE)        ;A = Leftmost byte
EA95  EDB0                 LDIR                  ;Shift pixel line
EA97  12                   LD      (DE),A        ;Rightmost byte = A
EA98  E1                   POP     HL
EA99  C1                   POP     BC
```

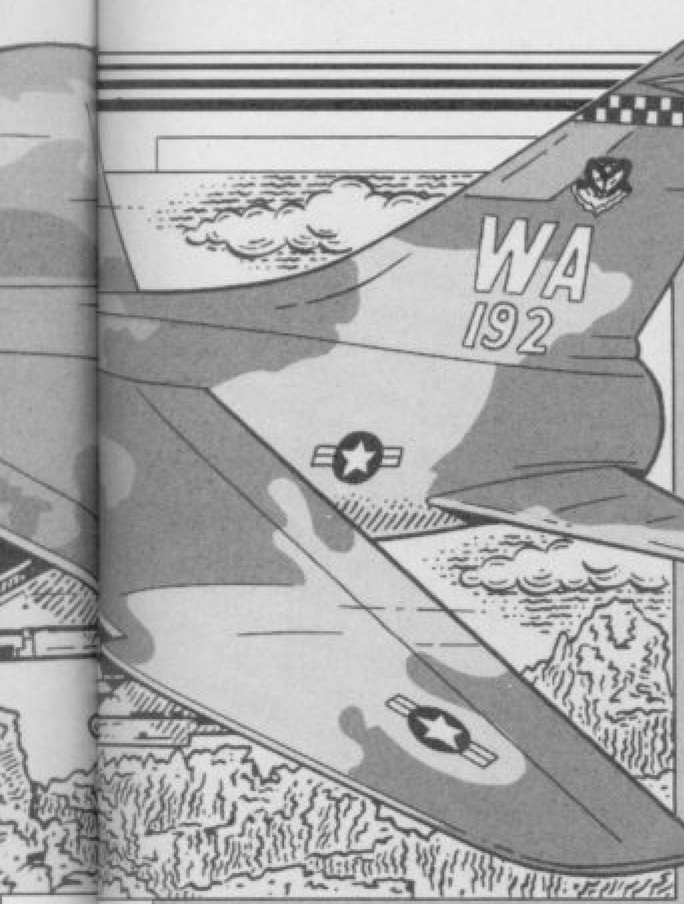


Figure 2.

```
  10 CLEAR 59999
  20 GO SUB 1000
  30 RESTORE
  40 FOR i=USR "a" TO USR "b"+7
  50 READ j
  60 POKE i,j
  70 NEXT i
  80 CLS
  90 PRINT AT 0,5;"Scramble-like
 display"
 100 LET yy=0: PLOT 0,147
 110 FOR x=1 TO 15: LET y=INT (4
0*RND)-20-yy: DRAW 16,y: LET yy=
yy+y: NEXT x
 120 DRAW 15,-yy: LET yy=0: PLOT
 0,23
 130 FOR x=1 TO 15: LET y=INT (4
7*RND)-23-yy:DRAW 16,y: LET yy=
yy+y: NEXT x
 140 DRAW 15,-yy
 150 PRINT AT 12,3;"AB"
 160 RANDOMIZE USR 60000
 170 GO TO 160
 180 STOP
 190 DATA 96,248,255,127,127,63
 200 DATA 31,15,0,0,0,248,196
 210 DATA 255,252,240
 999 STOP
1000 REM HEX LOAD ROUTINE
1010 DEF FN p(x)=CODE h$(x)-48-7
*(CODE h$(x)>=65)
1020 LET byte=0
1030 RESTORE 2000
1040 READ start
1050 READ h$
1060 IF h$="*" THEN  GO TO 1160
1070 IF LEN h$<>2*INT (LEN h$/2)
 THEN  PRINT "Odd number of hex
digits in: ";h$: STOP
1080 FOR i=1 TO LEN h$
1090 IF NOT ((h$(i)>="0" AND h$(
i)<="9") OR (h$(i)>="A" AND h$(i
)<="F")) THEN  PRINT  "Illegal h
ex digit: ";h$(i): STOP
1100 NEXT i
1110 FOR i=1 TO LEN h$ STEP 2
1120 POKE start+byte,16*FN p(i)+
FN p(i+1)
1130 LET byte=byte+1
1140 NEXT i
1150 GO TO 1050
1160 PRINT "Code entered"
1170 PAUSE 150
1180 RETURN
2000 DATA 60000,"3E01","CD70EA"
2010 DATA "3E02","CD9DEA","3E03"
2020 DATA "CD70EA","C9"
2030 DATA "FE01","2005","21E13F"
2040 DATA "180F","FE02","2005"
2050 DATA "21E147","1806","FE03"
2060 DATA "C0","21E14F","0640"
2070 DATA "C5","012000","09"
2080 DATA "0D","54","5D","1D"
2090 DATA "E5","1A","EDB0","12"
2100 DATA "E1","C1","10EE","C9"
2110 DATA "FE01","2005","21FE3F"
2120 DATA "180F","FE02","2005"
2130 DATA "21FE47","1806","FE03"
2140 DATA "C0","21FE4F","0640"
2150 DATA "C5","012000","09"
2160 DATA "0D","54","5D","1C"
2170 DATA "E5","1A","EDB8","12"
2180 DATA "E1","C1","10EE","C9"
2190 DATA "*"
```

answer is to use the following piece of code:

```
LD HL,start_location
LD D,H    ;
LD E,L    ; DE = HL+1
INC DE    ;
LD BC,no_bytes-1
LD (HL),pattern_byte
LDIR
```

That works by copying the initial pattern_byte value into the next location, then updating the HL register so that it equals the previous DE register pair, which has also been incremented, ready to copy the same value again.

There are two similar instructions to LDI and LDIR, known as LDD and LDDR. Those perform a similar operation, but instead of incrementing the DE and HL register pairs, they are decremented — BC is always decremented.

Those can be very useful in order to avoid overwriting relevant locations. For example, if we wanted to copy 2000 memory locations from location 50000 to location 51000, we would have a problem. Using the LDIR instruction, we would probably write something like

```
LD HL,50000
LD DE,51000
LD BC,2000
LDIR
```

However, the first 1000 iterations of the loop will overwrite locations 51000 to 51999 before they are copied. We can avoid the problem by using LDDR:

```
LD HL,51999
LD DE,52999
LD BC,2000
LDDR
```

That will still overwrite the same locations, but only after they have been copied. If you look at the assembly code in figure one, you will notice that the same method has been used to avoid overwriting when scrolling the screen to the left or right.

In addition to those transfer instructions, there is a corresponding set of search operations. Those have the mnemonics CPD, CPDR, CPI and CPIR. The CPD instruction will compare the value in the accumulator with the value held in the location addressed by the HL register pair, just like the CP (HL) instruction. However, the CPD instruction will also decrement both the BC and HL register pairs.

That may not seem of much use, but the repeated version is far more powerful. The CPDR operation will repeat the CPD instruction, stopping

continued on page 56

```
EA9A  10EE              DJNZ  LLOOP        ;Repeat for 1/3 screen
EA9C  C9                RET

EA9D  FE01    RIGHT     CP    1            ;If A = 1, then set HL
EA9F  2005              JR    NZ,RNOTOP    ;  for top of screen
EAA1  21FE3F            LD    HL,3FFEH
EAA4  180F              JR    RTSCR
EAA6  FE02    RNOTOP    CP    2            ;If A = 2, then set HL
EAA8  2005              JR    NZ,RNOMID    ;  for middle of screen
EAAA  21FE47            LD    HL,47FEH
EAAD  1806              JR    RTSCR
EAAF  FE03    RNOMID    CP    3            ;If A = 3, then set HL
EAB1  C0                RET   NZ           ;  for bottom of screen
EAB2  21FE4F            LD    HL,4FFEH
EAB5  0640    RTSCR     LD    B,64         ;B = 64 pixel lines
EAB7  C5      RLOOP     PUSH  BC
EAB8  012000            LD    BC,32        ;BC = 32 bytes per line
EABB  09                ADD   HL,BC
EABC  0D                DEC   C            ;BC = 31 LDDR loops
EABD  54                LD    D,H
EABE  5D                LD    E,L
EABF  1C                INC   E            ;DE = HL + 1
EAC0  E5                PUSH  HL
EAC1  1A                LD    A,(DE)       ;A = Rightmost byte
EAC2  EDB8              LDDR               ;Shift pixel line
EAC4  12                LD    (DE),A       ;Leftmost byte = A
EAC5  E1                POP   HL
EAC6  C1                POP   BC
EAC7  10EE              DJNZ  RLOOP        ;Repeat for 1/3 screen
EAC9  C9                RET

                        END

Workarea      — A717 to A8B9
ORG    end — EACA
LOAD   end — EACA
```

Illustration: Stephen Wright

Figure 3.
Left scroll using LDIR



Right scroll using LDRR

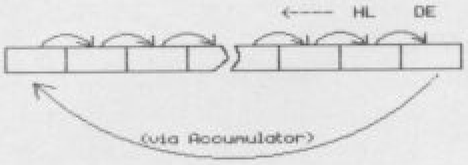
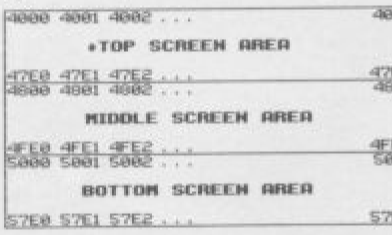


Figure 4. Spectrum screen layout



continued from page 55

when either the accumulator equals the current memory location addressed by the HL register pair, or if the BC register pair reaches zero.

That form of the instruction can have hundreds of uses, especially when operating with tables which may have a variable length. When handling databases, you can set HL to the start of the data, and BC to the maximum number of items. You can then easily search the table for a specific item, without running over the end. With variable length records, just use a dummy value — an impossible data value — to distinguish the end of the table. You can then search for that value in the accumulator, using the BC register pair to count the number of items.

The CPI and CPIR instructions are very similar to CPD and CPDR, but instead of decrementing the HL register pair after each comparison, HL is incremented. All of those instructions are summarised in figure five.

This month's example program implements two of the most useful of those instructions, LDIR and LDDR, to scroll parts of the display screen. The assembly code for the routines is shown in figure one, and the usual Basic loader and application programs are given in figure two. Just type that in and run it, taking care with the graphics characters in line 150.

There are two main routines, shown as LEFT and RIGHT in figure one. Those scroll the screen to the left and right respectively. Figure three shows how that is done for any particular line of pixels. When moving screen information to the left, it is important not to overwrite a byte before copying it, so the LDIR instruction is used. Conversely, the right scroll routine uses the LDDR instruction.

That still leaves the problems of overwriting the leftmost or rightmost byte. To avoid that the contents of the location addressed by the DE register pair are placed in the accumulator — which is unaffected by LDDR and LDIR — before shifting each pixel line. When the shift is complete, that value is placed back at the opposite end of the screen, giving a wraparound effect.

The DJNZ loop at the end of each routine uses the B register to loop around for all the pixel lines. If B were set to the total number of lines on the screen, then the whole screen would scroll. However, to make things a little more interesting, the routines have been modified to scroll only one third of the screen.

Figure four shows how the Spectrum screen locations are naturally divided into three areas. When calling the routines, the accumulator should be set to

1 — scroll top of screen.
2 — scroll middle of screen.
3 — scroll bottom of screen.

You can modify the routines easily to scroll as many or as few lines as you choose. When doing that bear in mind the Spectrum screen layout. The routines, at present, add 32 to the HL register pair to move to the next line. That means the top pixel line of eight character lines will scroll first, followed by the second pixel line of the same eight character lines, and so on. To scroll a single character line, it is only necessary to increment the most significant byte of the register pairs. So, to scroll the top line of the display to the left, you would use a routine like that in figure six.

Using a generalised version of that sort of routine, you could have alternate lines easily scrolling in opposite directions. That would be handy for such games as **Frogger.**

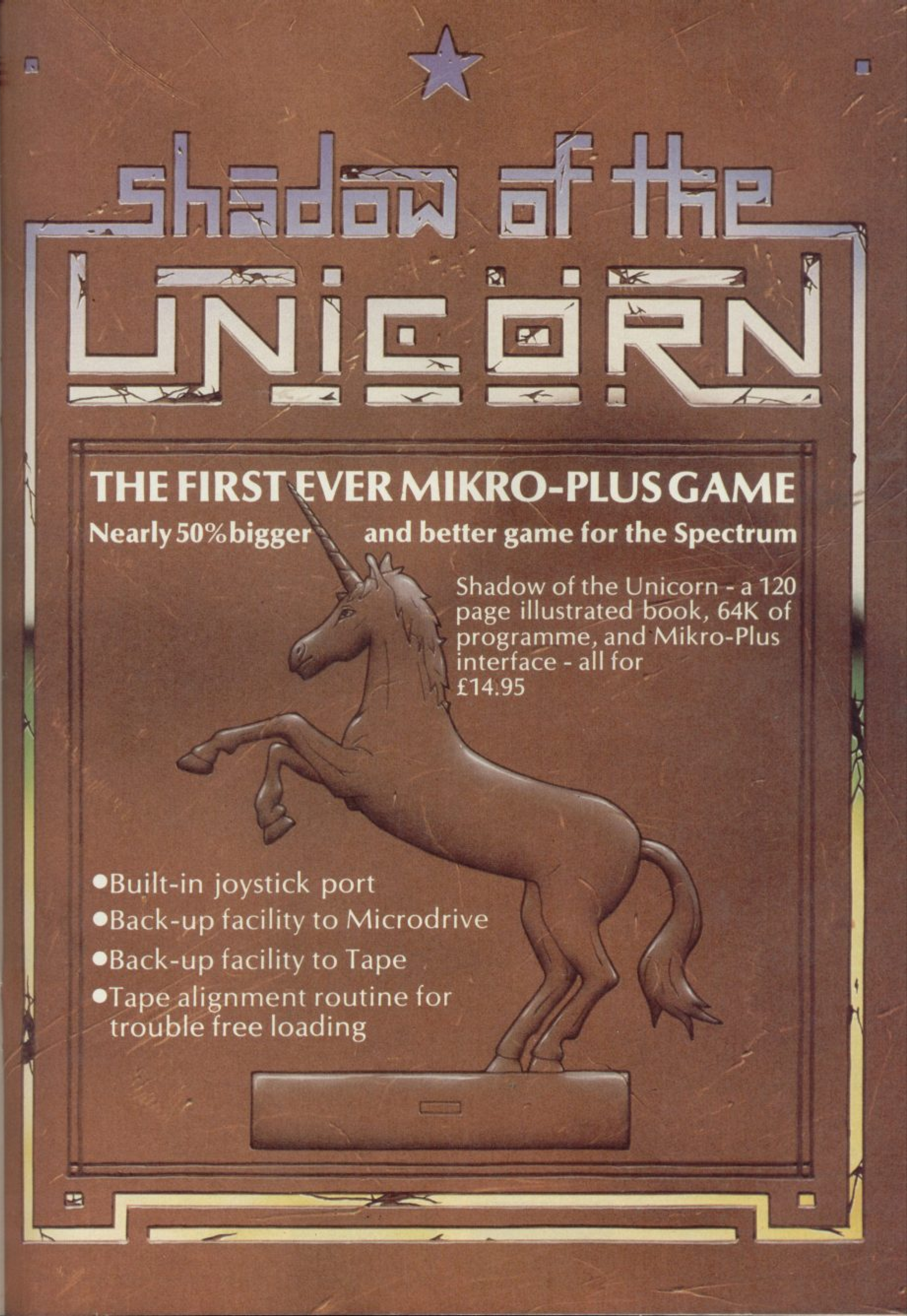
Next month we will look at a number of hidden registers, and a new type of addressing mode which can be used with common instructions.

Figure 5. New Z80 instruction codes

CPD	— compare the accumulator with the contents of the location addressed by the HL register pair. Set the zero flag accordingly, and decrement the HL and BC register pairs.
CPDR	— repeat CPD instruction until either the comparison is true (ie. accumulator equals memory) or the BC register pair is zero.
CPI	— compare the accumulator with the contents of the location addressed by the HL register pair. Set the zero flag accordingly, decrement the BC register pair, and increment the HL register pair.
CPIR	— repeat CPI instruction until either the comparison is true (ie. accumulator equals memory) or the BC register pair is zero.
LDD	— copy the contents of the location addressed by the HL register pair to the location addressed by the DE register pair. Decrement the BC, DE and HL register pairs.
LDDR	— repeat LDD instruction until the BC register pair is zero.
LDI	— copy the contents of the location addressed by the HL register pair to the location addressed by the DE register pair. Decrement the BC and increment the DE and HL register pairs.
LDIR	— repeat LDI instruction until the BC register pair is zero.

Figure 6

```
        LD      B,8         ;Eight pixel lines
        LD      DE,4000H    ;First byte of screen
        LD      HL,4001H    ;Second byte of screen
LOOP    PUSH    BC
        LD      BC,31       ;Number of bytes to scroll
        PUSH    DE
        PUSH    HL
        LD      A,(DE)      ;Store leftmost byte
        LDIR                ;Shift pixel line
        LD      (DE)        ;Restore as rightmost byte
        POP     HL
        INC     H           ;HL = HL + 256
        POP     DE
        INC     D           ;DE = DE + 256
        POP     BC
        DJNZ    LOOP        ;Repeat for eight lines
        RET
```


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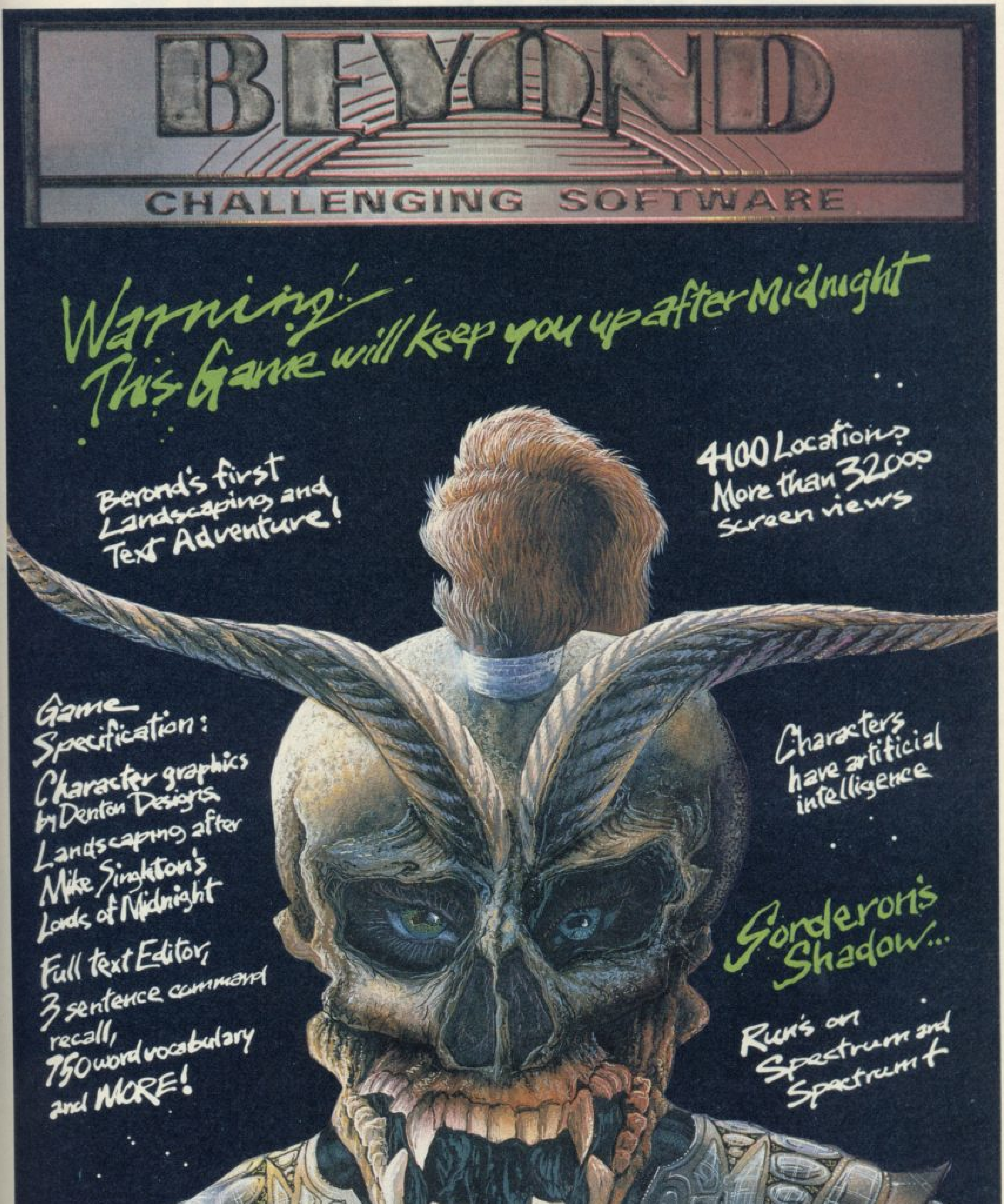
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Enter the Multi-User Dungeon

John Gilbert goes back in time to the dawn of a new world

A BLAZE of publicity accompanied the launch of the **Multi-User Dungeon** at the Personal Computer World Show in September.

The new version of the game can be accessed using the normal telephone network and is open between 6pm-8am on weekdays and all day at weekends.

The original game was written by Roy Trubshaw in 1980, when a student in his final year at Essex University. Simon Dally, manager of MUSE, the company set up to deal with MUD, says: "Roy wrote the core of the program supposedly as an academic project. He spent a lot of time on it and that is probably why he came out of Essex with a second instead of a first."

MUD was further developed by Richard Bartle for the Essex University DEC 10 computer. At first it was only open to students on campus but with the introduction of packet switching, allowing outsiders onto the system, gamers all over the country could take part.

MUSE, Multi-User Entertainment, was formed in 1984 to cope with the demand for the game, to expand the program and to develop new multi-user products. In April this year MUSE signed an agreement with British Telecom to jointly publish a new version of the game, a move which will influence future versions. MUSE estimates that it has taken 50,000 man hours to develop and write the game. Simon Dally says: "The original game had 419 rooms at the last count. Richard has been adding to them ever since. It's easy to expand the game using our specially developed MUD language MUDDLE — Multi-User Dungeon Development Language."

The BT version has three times as many rooms as the original and includes two new geographic areas.

Many players have gained notoriety in the original game, which is still running at Essex University, and MUSE hopes that they will play some part in the new game. They include Jez the Wizard, Sue the Witch and Egor the Wizard. All have attained the immortal status of witch or wizard which allows them to help run the game.

Sue the Witch has been acclaimed as MUD's greatest player. As soon as the original game became available through Essex University she logged on and played continually. She has become a bastion of knowledge about MUD and, soon after commencing play, reached the level of Wiz.

Jez was the first MUD player outside the University campus to achieve Wiz status, but now he has achieved a level within the MUD structure which is second only to Richard Bartle, co-designer of the game. He is one of only three people allowed to use Bartle's Wizard persona, called Debugger, a powerful character who acts as a utility program within the computer operating system. He will help people if they have forgotten their passwords, or lay down the law when players have a dispute. The new game has its own policeman, the Arch-Wizard. He acts as a system co-ordinator and monitors the state of play.

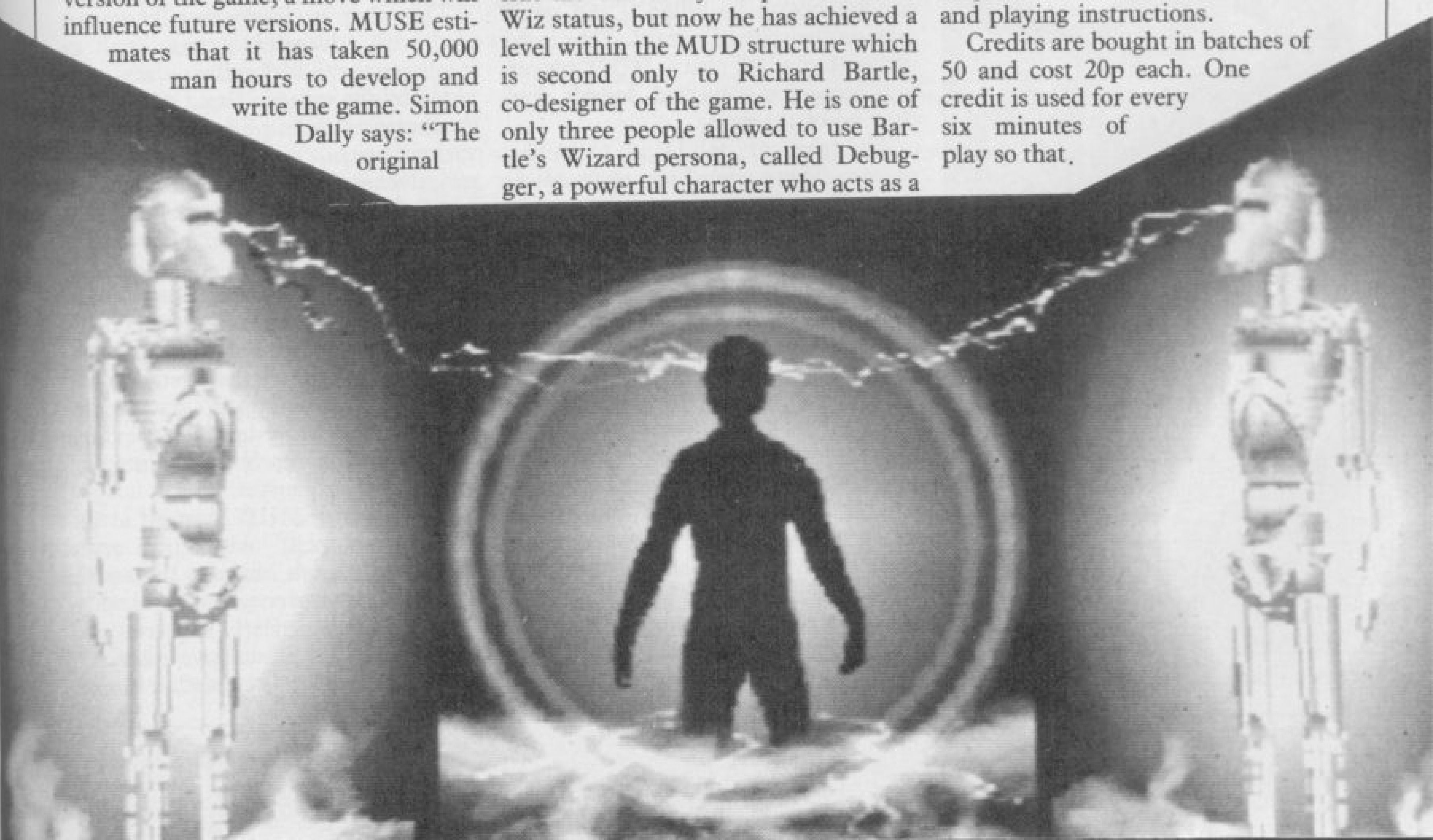
Getting hooked up and into MUD is easy. You will need a modem which is compatible with your computer, and terminal software which will make your machine talk to the MUD VAX.

For the Spectrum you could use the VTX 5000 which is sold by Modem House, Iolanthe Drive, Exeter, Devon EX4 9EA. It costs £49.95 but you will also need terminal, or bulletin board, software which will produce a screen scroll.

If you have a QL you could use a Q-CON modem which can be obtained from Tandata Marketing, Albert Road North, Malvern, Worcester WR14 2TL. It costs £89.95 and will make your machine communicate at split baud rates.

Once you have the hardware you should contact the New Information Services department of British Telecom to get the MUD player's pack. The starter pack retails at £20.00 and can only be obtained through mail order by ringing the MUD line on 01-608 1173. The pack includes a map, a security card, 30 game credits and playing instructions.

Credits are bought in batches of 50 and cost 20p each. One credit is used for every six minutes of play so that.



MULTI-USER DUNGEON is the most advanced, interactive, computerised adventure game in the world.

Unlike normal adventures where there's no-one around to see you battle against the monsters, score points and carry out deeds of daring, MUD is affected by the people playing at the same time as you. You can chat CB-style to your fellow adventurers, cast spells on them, help them, even attack them making every game of MUD different. You can save your persona on the computer any time you like and later, continue play from where you left off. To play MUD you need a home computer – almost any with an RS-323 port will do – and a modem.

Getting stuck into MUD



Illustration: Stephen Wright

In MUD your score determines your level, which in turn determines your ability to play. For example, while novices are still wandering around the mainland exploring, more advanced players are off on the island hunting dragons!

Eventually your score will get high enough – assuming you're clever enough not to be killed – and you'll take on the rank of wizard. That is the ultimate aim of every MUD player, but becoming a wizard doesn't spell the end of the game.

The aim of MUD is to collect points. There are three ways to do that. The most common way is to get treasure and drop it in the swamp, which effectively puts it out of the game, so points can't be scored for it twice. The second most common way is by killing people. When you top another player, you get one twenty-fourth of their points, in general. The last way is to do some menial task such as making the bed.

You can lose points, too. Points can be lost for doing stupid things like trying to smoke the wolfsbane, but more often than not they go when you're killed. In MUD you die often, how permanent depends upon how it happened. If you're dead, it normally means you did something which killed you, like jump off the cliff without some sort of parachute, or drink poison or whatever. That, in mudspeke is known as being DEAD.

You can come back from being DEAD, but you lose points for it. If you are killed in a fight, however, you end up permanently deceased, or DEAD DEAD. Hence, although fights have good rewards when won, they're soul destroying when you lose!

The only way to be DEAD DEAD for doing something silly is if you carry unranium around with you, ignoring the messages about how tired you feel, until your stamina drops below zero. Resurrection is the only way to recover from being DEAD DEAD and it costs half your points. The only alternative is to start again.

As players with more points tend to be more popular targets for those with an urge to kill, they have better attributes than those with which they started. MUD generates a random set of characteristics for you when you start – your persona which consists of three attributes, those being, strength, stamina and dexterity.

The other attributes usually associated with adventure games, such as intelligence and charisma, are provided by the gamer. Those three main attributes affect your gameplay in various ways, most obviously your effectiveness in a fight. Strength determines how much damage you'll do to your opponent, stamina how much damage you can take, and dexterity affects your chances of landing a blow. The average total of a new character's attributes is about a hundred and fifty, but as your score increases so do your attributes. When you go up a level, your attributes go up by 10 points each until you reach a maximum of 100 in each category.

The levels in MUD changed as the game developed, with the score needed to reach wizard increasing approximately seventy thousand when MUD started, to nearly a quarter of a million! That is due to two reasons – firstly, the game has expanded in size,

and there is more treasure for the taking. Secondly, MUD has been solved by quite a few people, and those who ask enough questions will be well on their way to wizdom. So, as more players solve the game, the level of difficulty required to become a wizard must be preserved.

The reason for the exponential gain in points between levels is that novice players take just as long to gain their first level as the more experienced players take to move from Sorcerer to Necromancer. That allows the better players to get back quickly to their level of play – if they're killed – and go off in search of treasure completely

In an extract from his forthcoming book, Duncan Howard introduces the Multi-User Dungeon

beyond the reach of the newer players.

MUD is a huge game, played in an area often described as the Land. Currently, MUD has over a thousand rooms to explore so it's easy to see why you'll be able to spend quite a long time just getting familiar with the game. A room doesn't have to be an enclosed chamber but, as with most adventure games, it's an area with its own description. The eastern pasture is as much a room, for example, as the entrance to the mine.

You move from one room to another by telling MUD to move your persona in a specific direction such as: GO SOUTH. To find out where most of the exits from a room are, type EXITS and a list of possible directions is displayed. Sometimes exits are hidden and it's wise to try out every possibility.

As you explore the Land it's likely that you'll encounter one of the wizards or witches which have mastered the game. Called wizzes, those are players who have finished MUD and are now playing as the game's referees, helping – or hindering – the mortal players as they see fit. Wizards have powers far beyond those of ordinary players. They can be great allies, but they can also be horrendous enemies if you get on the wrong side of them.

Wizards are usually helpful, but if you pester them for advice and points it won't go well for you in the long run. A major portion of the game is learning to allow for each wizard's eccentricities.

Most of the objects scattered about the Land are worth points if dropped in the swamp. Some of the treasure is very easy to find, but isn't worth very much. New players are left to go after that, while the more experienced players go in quest of bigger and better things.

Easy to find treasure, called surface T because it's just sitting on the ground at the beginning of each game, doesn't last too long as players snap it up very quickly. The other treasures

continued on page 64

Part of a logged game of MUD

ESSEX UNIVERSITY: Multi-User Dungeon.
This Mud created: 17th July 1985 at 12:09:08
Origin of version: 06:19:21.
Accumulated game time: 5 mins 2 secs.

Welcome! By what name shall I call you?
★PATHOS

This person already exists – what's the password?
★Password
Yes!
Your last game was today at 6:24:32.

Hello again, Pathos the champion!
Narrow road between lancs.
You are stood on a narrow road between The Land and whence you came. To the north and south are the small foothills of a pair of majestic mountains, with a large wall running round. To the west the road continues, where in the distance you can see a thatched cottage opposite an ancient cemetary. The way out is to the east, where a shroud of mist covers the secret pass by which you entered The Land.
Mugsanon the witch is here, carrying key.

★Fanman the enchanter has just arrived.

★Hi Wizard

★Mugsanon the witch says "Hi Pathos"

★who
Maria the sorceress is playing
Pathos the champion is playing
Fanman the enchanter is playing
Mugsanon the witch is playing
Tana the legend is playing
Aphrodite the warrior is playing
Jethro is playing
Grobble the legend is playing
Kalamzoo the superhero is playing
Rebecca the necromancess is playing
Stev is playing
. . .

★sc
Score to date: 1766
Level of experience: Champion
Strength: 90 Stamina: 85 Dexterity: 92 Sex: Male
Maximum stamina: 85
Weight carried: 0g (max. weight: 90000g)
Objects carried: 0 (max. number: 11)
Games played to date: 2
. . .

★n
Vicious rocks.
An animated skeleton bars your way.

★ki skeleton
★The strength of a blow by the skeleton sends you sideways. Yet courageously you carry on, and charge back into the action. Your follow-through thrust sends the skeleton to the ground!
. . .

★You are stricken by the force of a slash from the skeleton! Groggily you compose, and stagger forward into the melee. Your next blow sends the skeleton flying!
. . .

★Your last swing took the life of the skeleton!
You are victorious – this time . . .

(★)n
You hear the clear notes of a flute ringing through the air.

(★)In front of hut.
★"Ah well . . . time to go home.
★quit

continued from page 63

which lie deep in tin mines or in wrecked galleons off the coast are much more difficult to reach, and the major portion of each game is spent trying to find those. The most valuable of all the treasures is not only hard to find, but protected by all manner of puzzles, riddles and traps!

Players will find that if they play in teams, MUD becomes much easier. Working together, two players can accomplish a lot more in the same amount of time than if they weren't co-operating. Some players take a fiendish delight in double-crossing former allies and making off with the loot, so choose your friends carefully.

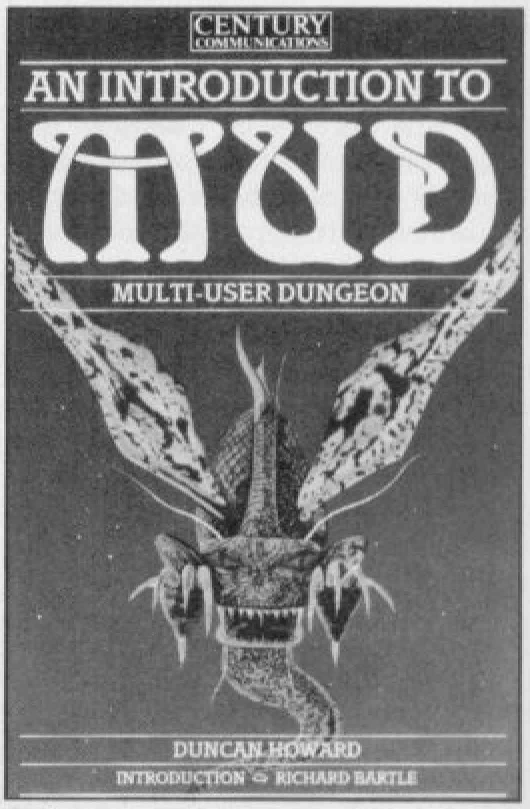
On top of that, wizards often intervene, by forcing one member of a team to do something which causes the other to doubt his reliability. Occasionally, gangs will form and terrorize other players, who often develop their own gangs.

Long sessions of play will eventually deplete the Land's supply of treasure, and at that point a wizard will reset the game. A reset forces all players to quit and saves their personas. It then restores the Land to its original state, with all treasure – and monsters – put back. A reset can be upsetting to players who have spent a lot of time getting to a specific area only to get chucked out of the game, so wizards will normally only reset the game if every player agrees to it.

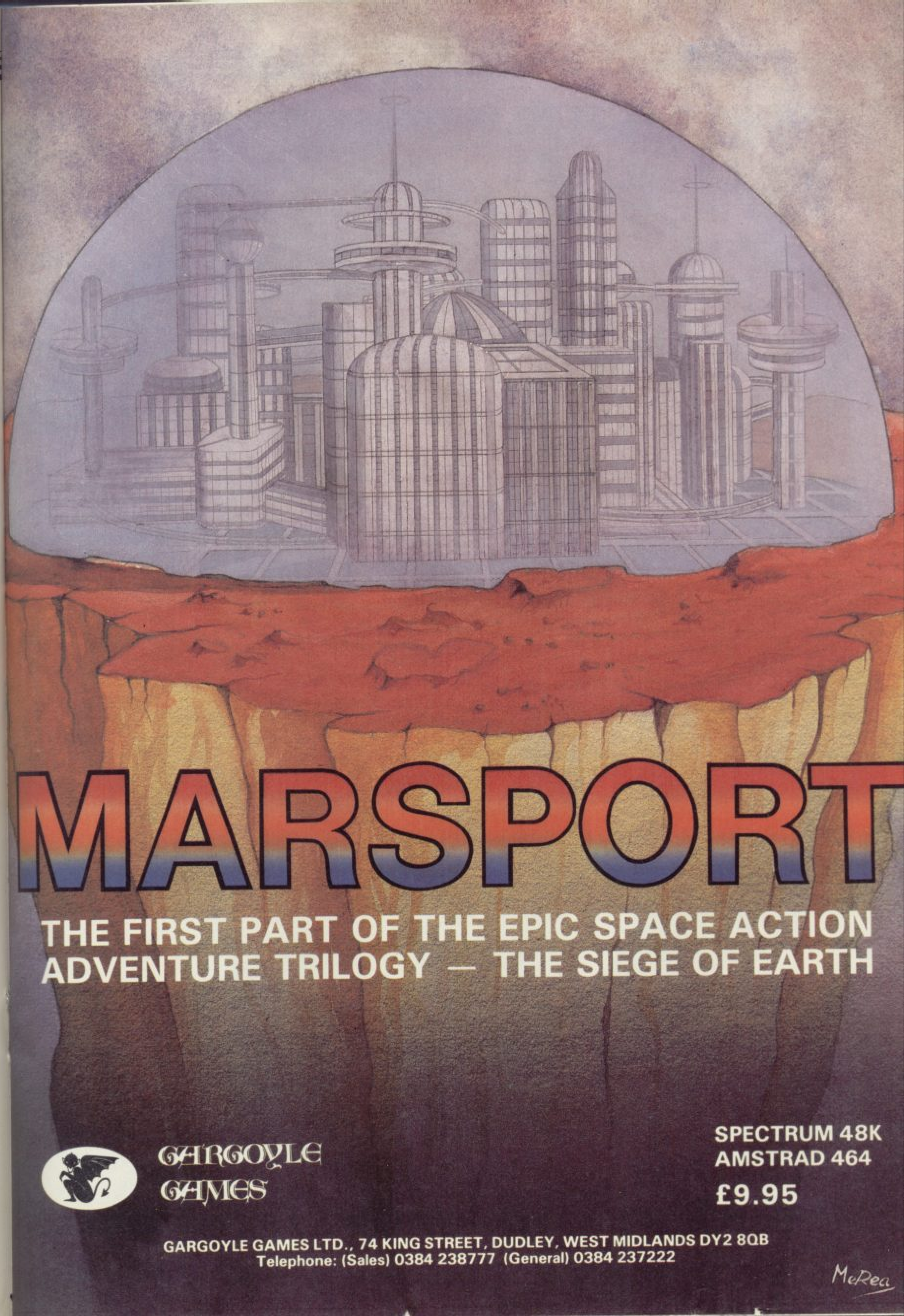
On the other hand, MUD sometimes needs to reset itself in which case you get the message 'Something magical is happening . . .'

In that case you will leave the game, and restart in two or three minutes. If you lose many points, a friendly wizard will be happy to help you regain lost points. That doesn't happen too often, but to be safe you should type in SAVE every time you drop some treasure in the swamp or score a lot of points.

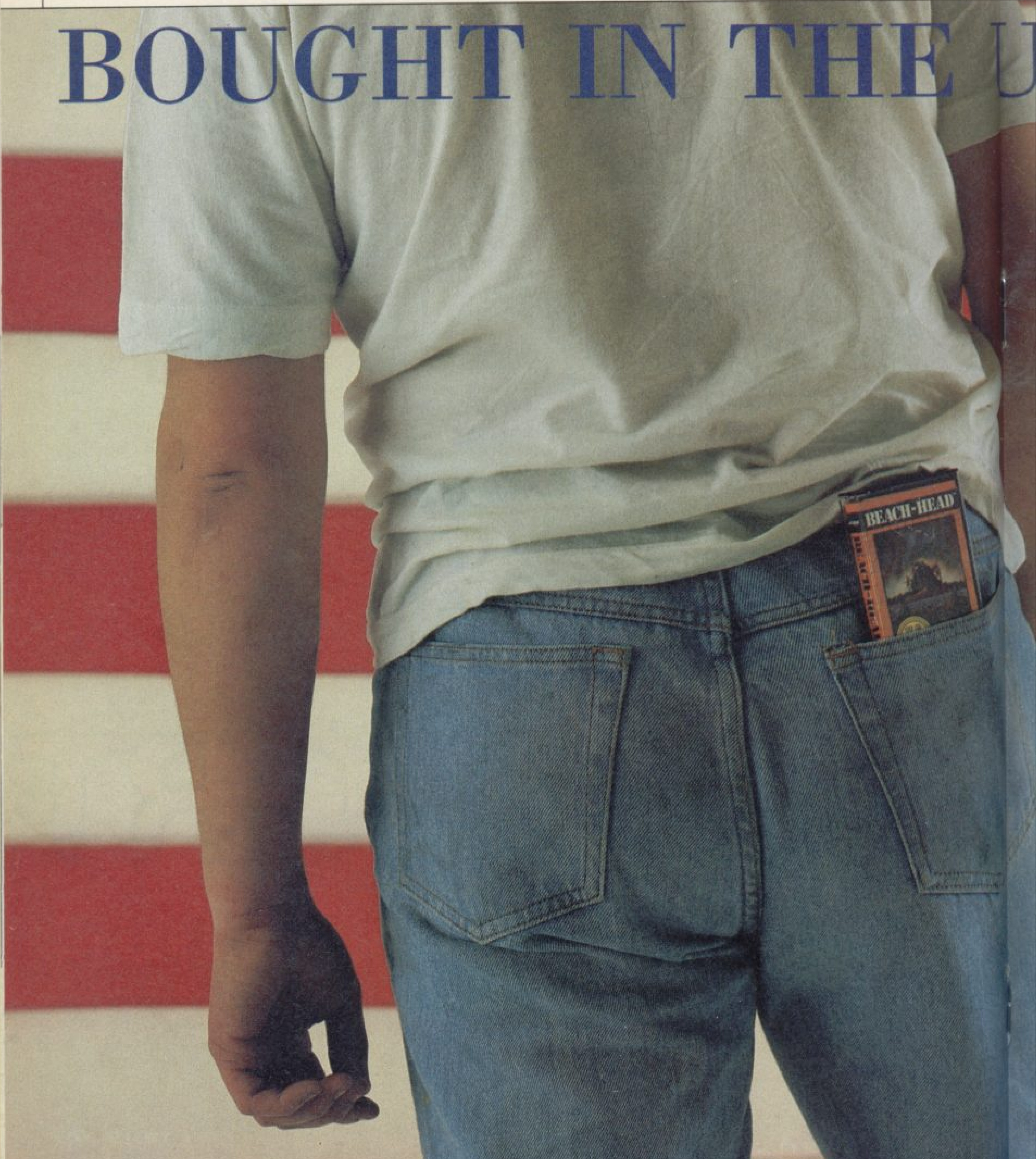
If there are no wizards about and the game has run out of treasure, there is a way in MUD to allow mortals to reset the game. It's currently a 'reset button' hidden deep in the mine, which will only work if the majority of the treasures are in the swamp and if no-one else is playing. That prevents mortals, who find the button, from making life a misery for everyone else by resetting the game once a minute.



● *An extract from* **An Introduction to MUD** *Duncan Howard 1985 ISBN 07126 06912, by permission of Century Communications Ltd. Can be obtained from most good bookshops, price £4.95, or mail order from Trade Department, Tiptree Book Services, Church Road, Tiptree, Essex.*


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As American games invade our charts, Chris Bourne takes the crust off the apple pie and assesses the quality

RUBBISH. Unadulterated rip-off pap for suckers with a fat wad of notes in their billfold. American software — about as nourishing as a cardboard waffle smeared with jello. As original as *Dynasty*, as talented as Madonna, as intelligent as *Rambo*. And by God's own country, doesn't it sell well in the UK?

The truth is, you can expect to see at least five American games in the top 30 every month — and that's likely to rise come Christmas. We've always been proud in the UK of the quality of our software, and that includes business and mainframe programming as well as the games market. But is it really as good as we think? Is the stuff brought over from the Americas better? And if it's the rubbish most British software houses like to think it is, why does it sell so well?

In other words, are you, the games-buying public, tasteless wallies? Or is the hype taking you for a ride? or — and a thousand programmers shudder in fear at the thought — have the Yanks got something we haven't, and really do give the public what they want?

Stay tuned for the facts, and judge for yourselves . . .

What is American software?

Some people would have you believe there's no such thing as a software industry. "It's just a lot of people who don't know each other," says David Ward, a major shareholder in US Gold, the leading UK software house dealing in American games, and the leading software house in sales, period. Yes — nobody flogs more plastic into the distributors than US Gold. That's the reality of the market.

Ward resists the idea that there's any real difference between the American and British industries, because he rejects the idea that you can define what the industry is nationwide. So why is US Gold software advertised as 'All-American software'? Buy this, it's from the Big Boys — that's the message, and to judge from the sales, we lap it up.

"There's no reason why it should be any different from anything else," says Ward. "Thirty per cent of TV shows are American. That's what's in the ratings. It's the same with anything."

Maybe that's why his own company, Ocean, is bringing out **Rambo** — Fast Load Part II. Hey, do you think they'll have the bit where he blows the gook apart with the exploding arrow? Wouldn't that be great?

Well. The American software industry, if it exists, is certainly different. The games we see over here are not necessarily the hits from the States. Ariolasoft's strategy game, **Archon**, bombed in the UK, but was plugged on the packaging as a 'US Top Ten hit'. It's a sluggish strategy game, a sort of chess variant with magic and arcade sequences for deciding who takes what. It never stood a chance over here, and you won't see US Gold bringing anything remotely like that across the herring pond.

"According to the Billboard charts, simulations seem to be really hot." That's Dave Gardener talking, project manager for Electronic Arts in California. Simulations? You try getting a simulation to number one in the UK charts. The last time it happened was with **Chequered Flag** two years ago. What about the arcade games?

"Arcade games haven't been able to maintain their position. Look, we shoot for a shelf life of years." It's true. **Flight Simulation**, a grandaddy of the genre from Microsoft, has been topping the charts on and off for the last three or four years.

Today's big American games are massive disk-based productions. They cost around $40 — even cassette games cost at least $20 over there. At the upper end of the market, the games cost more than the cheapest computers.

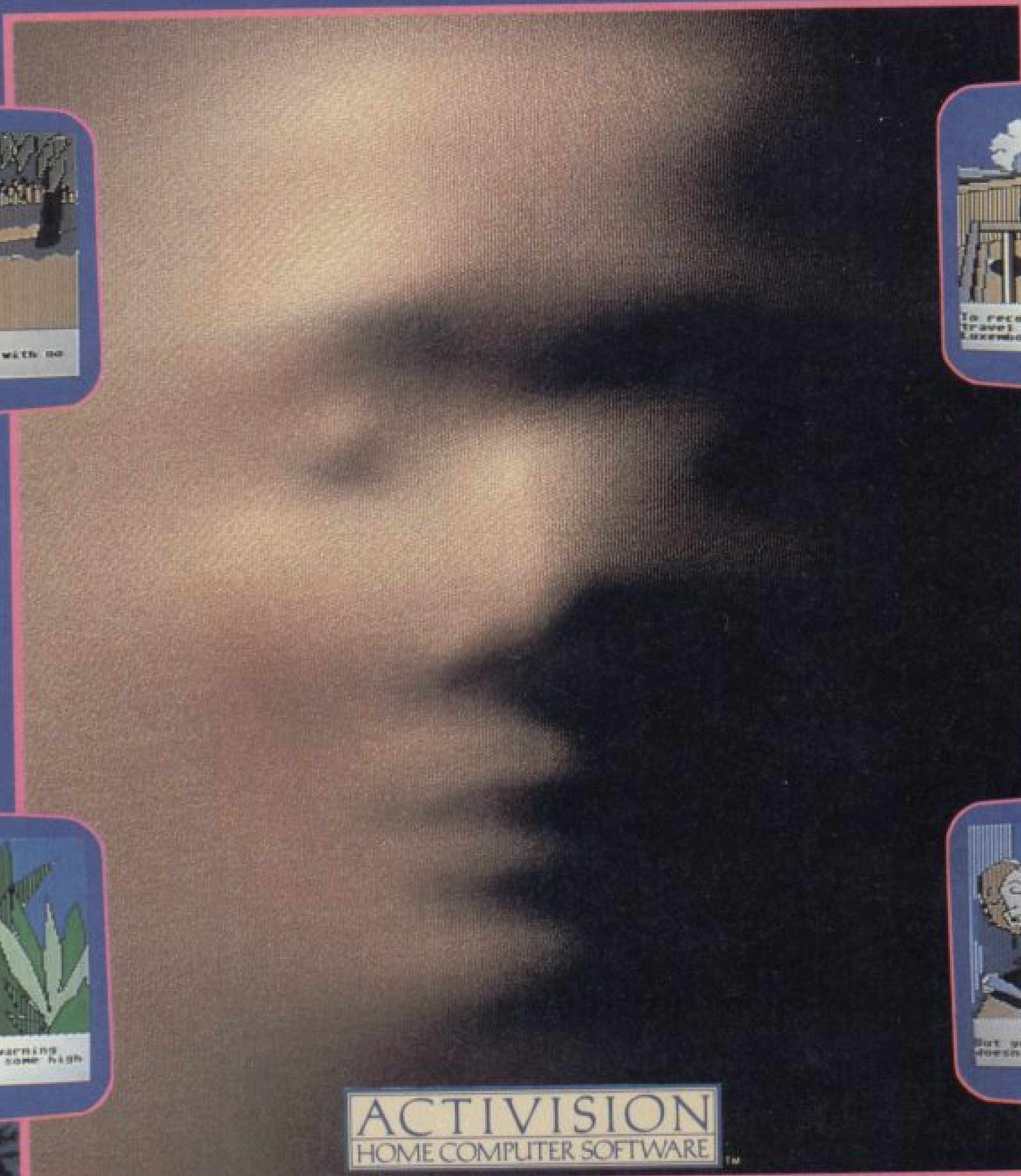
They're complex games, full of detail. Gardener cites **Spanish Conquest** as an example, where you sail from Spain to conquer the New World. "What's been put on it is 11 million square miles of playing area with 2,800 different screens. That takes up an entire Commodore disk and it never stops running."

It sounds great, but it also sounds a

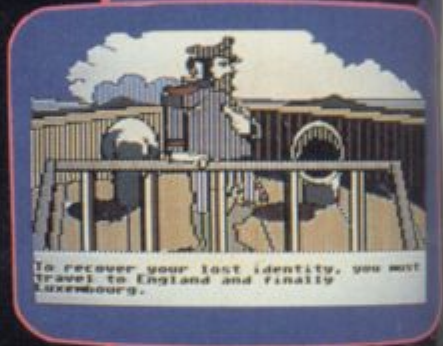
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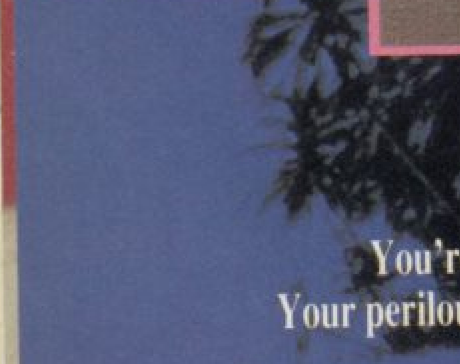
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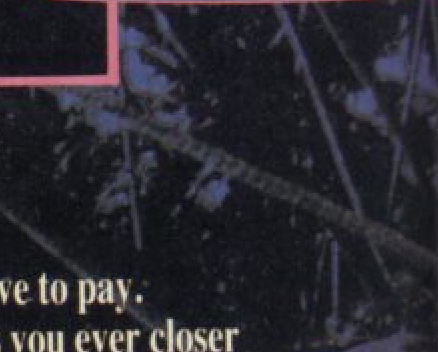
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bit daunting to those of us who call 60 screens 'massive' and can easily get lost in a tiny fraction of the playing area. Why do they think so big out there? Is it part and parcel of being American, working in skyscrapers and owning Cadillacs? Does it just go with the territory?

"The people buying our product are older," says Gardener. "People I talk to say 'No! I don't wanna buy a game! Music — that's cool. I want into that.' You can bring out a pinball game like a construction set — people can change it and just get a kick out of that. The products that sell well are simulations, and incredibly detailed."

Along with **Spanish Conquest**, here are a few of the games you won't be seeing on the Spectrum — this Christmas or any other. **Alternate Reality** — that's a role-playing adventure game by Datasoft, who produced the more familiar **Bruce Lee**. It has brilliant 3D graphics and comes on seven disks as a series. The whole lot would set you back $240. Or there's Activision's **Countdown to Shutdown**, with its 2000 room energy plant 'the size of a small city'.

Not everybody likes the way the US market is going. Rick Banks of Sydney in Ottawa, which produced **BC's Quest for Tyres** and **Dam Busters**, for one. "Software is ridiculously expensive here", he says. "I almost feel guilty when I walk into a shop and see games selling for $40. It's not fair. The kids are being ripped off."

OK Rick, so why not sell them cheaper? Mastertronic, our own budget software house, sells games in the States for $10. That's dirt cheap. "It's not from the development side of the industry. But if we went for British prices then it would be difficult just to break even."

Banks talks about games as games, not 'computer entertainment' which is the standard phrase used in the States. "They talk about computer games as art," he says. "I'm not embarrassed by the fact that they're games. In North America they get carried away with options and construction kits. If there's a byte you can change, it turns into another option."

Dave Gardener backs that up. "I shudder to call them games," he admits. He's proud of the complexity of a total computer entertainment environment.

"Maybe the English just want to get in there and have fun," he says, sounding perhaps a little dubious about the idea.

"You know, gameplay has got something to do with it," says Rick Banks. "Having fun."

Which do we buy?

That's what they're playing in the States, and it sounds a lot different from the sort of programs sold by US Gold, or Activision. Those games are completely arcade-orientated, often taken from coin operated machines, converted to the Commodore 64 in the US and then to the Spectrum in the UK.

American software houses don't write for the Spectrum at all. Most don't understand it, and if they do they tend to look down on it. In the USA Sinclair means the ZX-81, and forget it. They certainly boggle at the prices we sell games at. Even cassettes usually cost $20 at least.

It took two years for US Gold to persuade American software houses to sell games over here, through them. But the attractions to UK software houses of licensing American product were enormous. Geoff Heath used to run Activision UK, which handled **Ghostbusters**, so he should know a thing or two.

He says the attraction to UK software houses of licensing American games is because you get instant games. There was a backlog of titles built up, programmed for the Commodore 64, which could be instantly released in the UK, followed a couple of months later by the Spectrum conversion.

"Not just the good ones," adds Heath. "The bad ones came over too." He freely admits — now that he's working for Melbourne House — that **Ghostbusters**, the leading Activision game, was never much good on the Spectrum. **Ghostbusters** sold on the back of the film. Activision claims to have sold in excess of 300,000 copies, a staggering total when you consider that 50,000 makes a game a big hit in the UK.

"Mind you," says Heath, "They're not all bad. I tried to get **Beach-head** — I thought that was terrific."

Ghostbusters was written in the US by Activision's David Crane. Crane also wrote the two Pitfall games, and he's something of a star in the States. He earns large quantities of money, "somewhere on the level of a corporate vice-president," he claims. But the games, converted to the Spectrum, look tatty and old-fashioned.

That's probably because a lot of US software over here *is* old-fashioned. It's the backlist of games, built up over the years, now picked apart by UK houses. Rick Banks says **Dam Busters**, only just released by US Gold, was originally written three years ago. That's one of the good ones. **BC's Quest for Tyres**, due out soon from Software Projects, is four years old.

Four years ago our games industry was pathetic compared to those programs. Today, programs like **Dun Darach** and **Way of the Exploding Fist** knock spots off most American games available for the Spectrum.

"The games are simply too large to be converted," says Heath, "and the market is smaller than people think. The number one company over there is Infocom — producing text-based adventures. **Beach-head** was not relatively successful in the States."

Adventures do cross over, and fairly successfully. Adventure International UK was set up by Mike Woodroffe to handle the growing demand he found in his shop for the games. The sister company in the States is the home of Scott Adams, who first brought text adventures to home computers.

Although those games are all disk-based, and supposedly far too long for the Spectrum, Woodroffe and his colleague Brian Howarth, who wrote the **Mysterious Adventure** series, have few problems squeezing them down to size for a single load cassette. That's partly because we're not used to the quality of graphics on American adventures, which load in a whole screen off the disk, but also because if you're writing for disk there's little need to be efficient.

"If you've got a lot of memory available you do tend to write sloppily," says Woodroffe. "Some of Scott's games take up much less space the way we do it."

Mind you, Woodroffe is making concessions to the extreme old age of

continued on page 72

Thinking software?

THE TASWORD WORD PROCESSORS

***T**he extensive features of the Tasword word processors are ideal for both the home and business user. Every Tasword comes complete with a comprehensive manual and a cassette or disc. The cassette or disc contains your TASWORD and TASWORD TUTOR. This teaches you word processing using TASWORD. Whether you have serious applications or simply want to learn about word processing, TASWORD and TASWORD TUTOR make it easy and enjoyable.*

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POPULAR COMPUTING WEEKLY NOVEMBER 1984

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Typical Tasprint output. Please note that different makes of printer produce different sized output.

TASPRINT (Spectrum)

Drives all the printer interfaces compatible with TASWORD TWO and can be used to print TASWORD TWO text files as well as output from your own Basic programs.

TASPRINT 48K Spectrum — cassette **£9·90**
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TASPRINT QL Sinclair QL — microdrive cartridge **£19·95**

TASPRINT 464

Can be used to print AMSWORD/TASWORD 464 text files in addition to output from your own Basic programs. Drives the **Amstrad DMP-1** in addition to the printers listed above.

TASPRINT 464 Amstrad CPC 464 & 664 — cassette **£9·90**
disc **£12·90**

TASWORD UPGRADES

Tasword 464 and Amsword owners: send your original cassette or disc (not the packaging) as proof of purchase. Your original will be returned together with Tasword 464-D on disc. — **£13·90**

. . . think Tasman

THE TASCOPY SCREEN COPIERS

The TASCOPY screen copiers print high resolution screen copies with different dot densities and patterns for the various screen colours. This gives the screen copies a shaded effect which presents on a monochrome scale the colours on the screen. With TASCOPY you can keep a permanent and impressive record of your screen pictures and diagrams. TASCOPY supports all the printers mentioned under TASPRINT.

TASCOPY (Spectrum & Interface 1)

The Spectrum TASCOPY is for use with the RS232 output on ZX Interface 1. It produces monochrome copies (in a choice of two sizes) as well as copies with the shaded "grey scale" effect described above.

TASCOPY ZX Spectrum — cassette **£9·90**, microdrive cartridge **£11·40**

TASCOPY QL

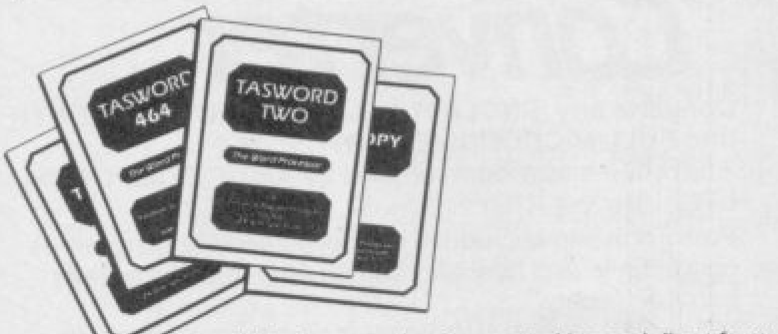
TASCOPY QL adds new commands to the QL Superbasic. Execute these commands to print a shaded copy of the screen contents. Print the entire screen or just a specified window. TASCOPY QL also produces large "poster size" screen copies on more than one sheet of paper which can then be cut and joined to make the poster, and high speed small copies.

TASCOPY QL Sinclair QL — microdrive cartridge **£12·90**

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Adds two new commands to the 464 Basic to give both a standard shaded screen copy as well as a "poster size" copy which is printed onto two or four sheets which can be cut and joined to make the poster.

TASCOPY 464 Amstrad CPC 464 & 664 — cassette **£9·90**, disc **£12·90**



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Transfer data from MASTERFILE to TASWORD TWO! Letters and forms typed on TASWORD TWO can be printed with addresses and data taken from MASTERFILE. The mail merge facility allows, for example, multiple copies of a letter to be printed, each containing a different name and address taken from your MASTERFILE data. To use TASMERGE you must have one or more microdrives as well as TASWORD TWO and MASTERFILE by Campbell Systems (version 9 or later).

TASMERGE ZX 48K Spectrum — **£10·90**

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continued from page 69

the original Scott Adams games — he's bringing them out in twin-packs, two at a time. "We didn't think we could fairly charge the full price for a single game, given their age," he says.

The new series, **Questprobe**, based on Marvel comic characters, is a different kettle of fish. Those are coming out reasonably quickly after their launch in the States, but they don't really match the high quality of the Infocom adventures such as the **Zork Trilogy**, or **Planetfall**. Those are highly literate games, with upwards of 800 locations per disk. Adams' games, once the best in the world, are much more downmarket productions.

So there are a few points to bear in mind when you feel tempted to buy American. Firstly, the best games will never get onto a Spectrum mainly because they are far too big to get onto a cassette.

Secondly, what you get offered in the shops is often old, out of date stuff. Just because it was once a hit in the States doesn't mean you're going to like it. You can't always trust the screen shots on the cassette, either — SEGA insists that US Gold use Commodore or coin-op shots even on its Spectrum games.

Thirdly, there's no guarantee that it's going to be good because it's American. Some of it is, some of it isn't — but it was written for a different market to start with, and tastes change.

David Ward is satisfied that the games stand or fall on the verdict of the consumers. "You can't kid the kids," he says. "What the public are offered and buy is what they think is the best."

Is it? **Ghostbusters** wasn't. Why did you buy it?

Tomorrow's games

A lot of British software houses resent the lead US Gold has in the UK market. Part of that is sour grapes, but none of those games, or any other import from America, is as good as the best of our software.

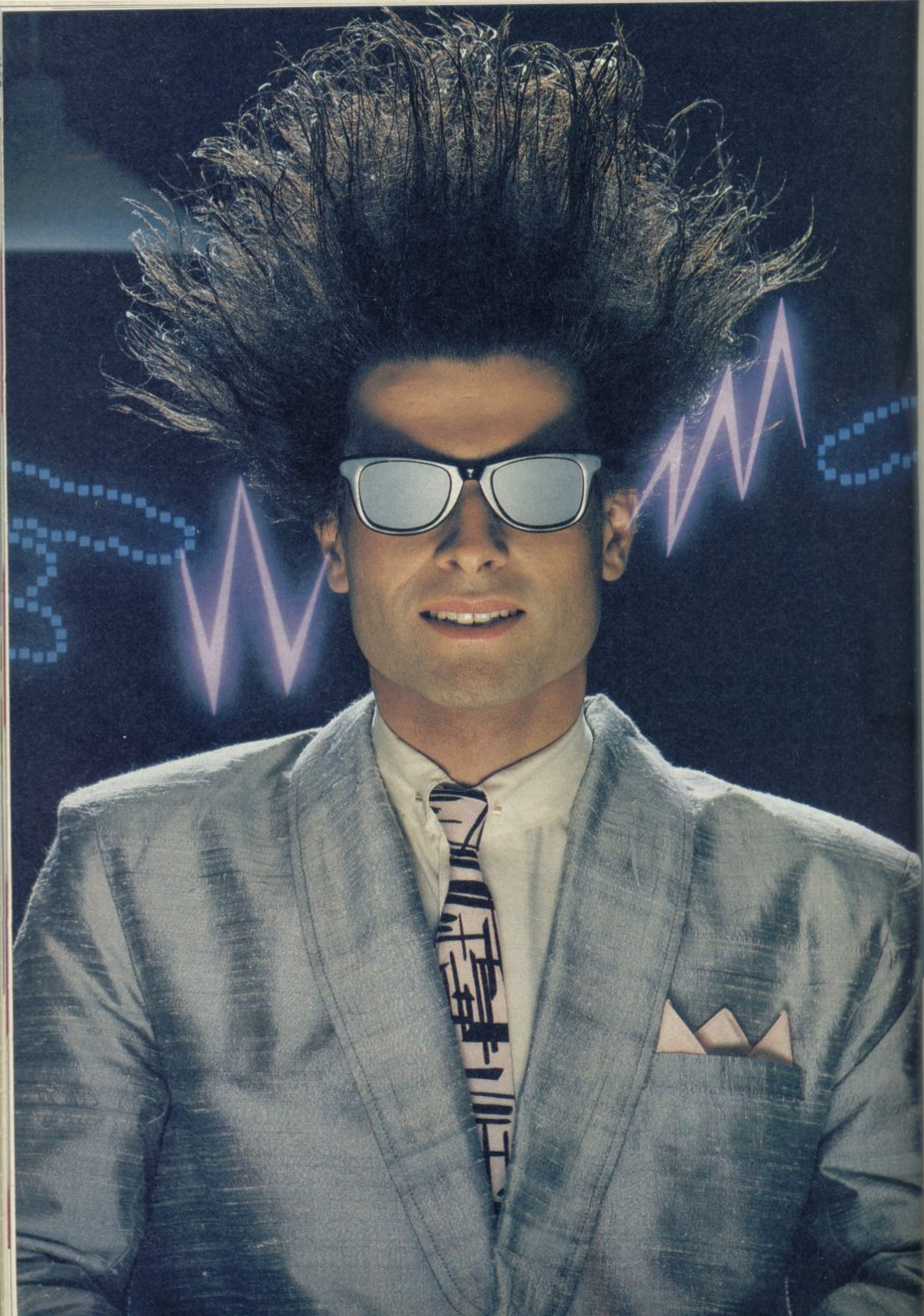
But if US Gold is dethroned, it will probably be because the supply of good games which can be converted dries up, rather than through our own programmers beating it into the ground on sheer quality. David Ward doesn't think that will happen. "Current releases are as many and varied as ever," he claims. "If you assume they're available for licence there'll be as much around."

It's downright impossible to reconcile that with Geoff Heath's view. "All the existing product is used up," he says, unambiguously. "People were able to release an accumulation of product in six to nine months. Now that's over, the amount of product available is a lot less."

And the new stuff, the good stuff, is the mega-games, the giant disk operas, the zillion screen experience. If those make it to the UK, they will make it on the Atari 520ST, the Amiga, and other machines with built-in disk drives. If those machines take off, the games will follow — "Simple hot and deep," as Dave Gardener puts it. "**Space Invaders** is not deep," he says. "We wouldn't have that in the US. Products in the US have to be deep."

"Oh, we would like to see that very much," says David Ward. "The UK market was built on cheap disposable software at pocket money prices. It depends on whether people build a home computer environment. If they do, we'll certainly be in there."

You can bet your forty buck diskette he will.



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SINCLAIR USER, JUNE 1984

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TASPRINT by Tasman Software £9.90p
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MASTERFILE by Campbell Systems £14.95p
This is one of the best database programs available for the ZX Spectrum. This program has many uses in a small business.

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Allows you to transfer data from Masterfile into Tasword enabling you to use Tasword for mail merge. The program allows you to specify line and column of each field. For use on micro-drive only.

TRANSEXPRESS by Romantic Robot £9.95p
Micro-drive utility program which will enable you to back-up all your micro-drive cartridges.

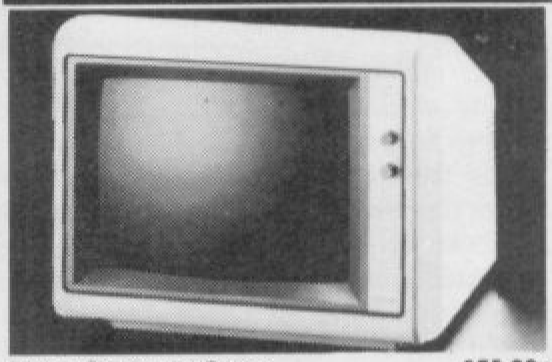
TASCOPY by Tasman Software £9.90p
This program allows you to produce 3 sizes of screen copy using Interface 1.

All software is supplied on cassette; if you require any of the business pack or invoicing programs supplied on disc please add £4.00p to the above price.

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Word Manager

SINCE THE release of **Tasword 2** it has been the acknowledged leading word processing program for the Spectrum. The release of two new programs, and rumours of a third, could well change that.

The new programs are from Oxford Computer Publishing – OCP – and Softechnics. OCP has given us an exclusive look at **Word Manager**, available on cassette at £12.95 – microdrive compatible – or at £19.95 for a Kempston disc interface version.

A good word processor is many things to many people but each should display text as it is typed in, enable the insertion and deletion of text at any point, and do so a character, word or block at a time. It should have margins which can be moved and a tab function similar to that on a typewriter. To give a professional look to the printed documents it should also be possible to line the text up on the left side only – left justified – or left and right sides – right justified. Other functions – such as replace, centre justification, footers and headers, and page numbers – are useful but not vital. **Word Manager** includes all of those.

Some other features include a mode for writing over existing text, a string search which lets you find any 16-character string in the text, the ability to print lines of up to 128 characters, and mailmerge – that is, printing a number of copies of the same text, usually a letter, each with different names and addresses. The mailmerge feature uses a file of names and addresses from the OCP **Address Manager**.

Although written for the Spectrum, **Word Manager** is easier to use on the Spectrum Plus with the extra keys. Unlike **Tasword 2**, which presents a blank screen for entering text from the start, **Word Manager** gives a menu of choices to start – see figure one. That menu is used to give information on the number of words entered, the memory used and remaining, and the cursor position. Moving to text already in memory gives the opportunity to move to any word in the text.

The first thing you will notice about the text screen is the column of lines down the left hand side. Those are new paragraph markers. Symbols are used to denote the types of justification, and special markers for the start of a new paragraph or page when printing. The screen will display up to 24 lines of 64 column text compared with the 22 columns of **Tasword**, but that is paid for by having no information on the current state of the text on the screen.

With no function keys on the Spectrum, programmers have had to resort to some unusual methods to include all the features. In this case it is the use of the unshifted numeric keys for functions rather than numbers. Pressing 1 changes between overwrite and insert modes, 2 locks on the capitals, 3 returns to the main menu, 4 to 9 move the cursor and 0 deletes characters.

With the Spectrum Plus the only one of those functions which does not have a separate key is 1. If you have a Plus, press Caps Lock first after loading the program; that allows you to use the numeric keys for numbers straight away.

The righthand margin can be set in two ways, one for printing and one for display. If you set the display margin to more than 64, each line will be shown over two lines on the screen, with the unused part highlighted in a different colour. An indent margin for new paragraphs can be set using the tab function. There appears to be no way of moving the left margin.

The tab function allows tables to be typed in columns although it is somewhat longwinded. One column must be typed in, the tab position reset and the next column typed in and so on. There is no tab function or indent margin on **Tasword**, although left and right margins can be set to any position between 0 and 64.

Tasword includes a feature called word-wrap, which automatically takes any word which straddles two lines into the second line. On **Word Manager** that is done only when the new paragraph key is pressed. If you are accustomed to word-wrap on your word processor you might be surprised to find that this does not make the slightest bit of difference when you are entering text.

Figure 1.

Press **S** to show script on screen
B to clear memory and show blank screen
j to justify
d to dejustify
★ to use microdrives
c to use cassette recorder
? for help screen
ENTER to return to BASIC

Note capital **B.** This will erase the current script memory.

Word count:	567
Memory used (chars):	8715
Space left (chars):	14325
Cursor position:	2

The range of options for deleting text is as good as many more expensive word processors, although perhaps not as convenient. The options include deleting characters either forwards or backwards – where **Tasword** will only delete forwards; deleting a line which consists of the character under the cursor and the next 63 characters; deleting a word; and deleting the rest of the paragraph. Using the block commands parts of a paragraph or several paragraphs can be deleted. In comparison, **Tasword** will delete characters and lines only.

Other block functions allow you to move or copy blocks of text from one place to another. A substitution function allows you to replace any string. That is very useful, especially when technical documents are being prepared. The disadvantage is that it changes all strings which match after the cursor. In comparison, the search

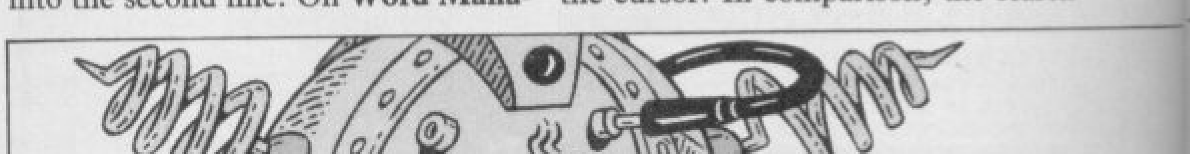


Illustration: Stephen Wright

feature finds the first occurrence in the text, asks if it is the right one and if not moves to the next and so on.

Thanks to the inclusion of printer/driver software for a range of interfaces, getting **Word Manager** to produce hard copy of your text is easy. However, the use of the graphics as printer control codes certainly gives **Tasword** the edge when it comes to controlling the printer to give different styles of print. **Tasword** can also be used with a ZX printer.

Other additional features of **Word Manager** are the ability to print lines of up to 128 characters, where **Tasword** can print only 64 character lines. A slow print simulates multi-tasking by allowing you to either create a new piece of text or edit the old while it is printing. Printing multiple copies of the text in either single or double spacing, and with or without page numbers, is available.

A mailmerge facility can only work when the word processor has access to a database. In this case the database is created by OCP's **Address Manager** and is limited to names, addresses and postcodes, whereas two separate programs – **Tasmerge** and **Masterfile** – are necessary to do the same with **Tasword**. **Tasword** does have, however, the advantage of a more flexible mailmerge system.

On the Spectrum Plus **Word Manager** is relatively easy to use, and presently it is certainly the most powerful word processor for the Spectrum. Owners of **Tasword** who decide to buy **Word Manager** might like to know that it will read **Tasword** files for editing.

Mike Wright

Publisher OCP
Price £12.95 (cassette), £19.95 disc
Memory 48K
★★★★★



Home Finance

WRITTEN by Buzzz Software for the QL, **Home Finance** is being marketed by Sinclair Research. It is designed to keep track of all your income and expenditure, and provides you with an up to the minute position of how much money you have, which accounts it is in, and when and where it was spent.

The program was written by the author of **Finance Manager**, which I consider one of the best financial programs available for the Spectrum. Despite its use of a greater variety of data and a greatly increased analysis section the similarities are obvious.

The manual is pocket sized but still in the standard QL black ring binder. It is well written and the illustrations help to show clearly how to use the program. In particular, I found the appendices very useful.

On loading you must first enter the date, type of display to be used and print line control codes. While the displays for both television and monitor are clear I found a preference for the TV display, even when using a monitor. The program is ready to drive Epson or Epson-compatible printers. However, a separate printer driver program is also included for other types of printer. Unfortunately it appears to allow only the use of the serial ports which may exclude its use with some disc systems which have their own printer port.

Before new transactions are entered the account used and existing transactions are displayed. Further transactions can be added without re-entering those details. Data for each transaction includes the date of the transaction, who it was with, a class, a description, a serial number of up to six digits, a single character identifier and the signed amount. The serial number is ideal for keeping a record of cheque numbers, while the identifier can be used to separate individual users of one account. Unlike **Finance Manager** the names of whom the transaction was with are not automatically set-up as accounts. It is possible to designate them as such either individually or globally.

If you make a mistake entering data it can be corrected by not adding the details to the account and re-entering them again or by adding them to the account and amending the incorrect sections.

A change option allows you to amend any transaction in the account. A regular use for that can often be found when checking entries against a bank statement. Your records will show the date on which a cheque was written – not the date on which the money was debited from your account. It is often useful to change the dates so that they agree with the bank statement.

To help you check your bank statements, transactions which appear on your statement, and which you agree are correct, can be marked with an R to show that they have been reconciled. The next time you want to check a statement you can display only those transactions which are unreconciled.

Printing or deleting large blocks of transactions is slightly more awkward than on **Finance Manager**. Only six transactions can be shown on the screen at one time. The block marker and print options are included on one sub menu which does not allow you to display the next transactions in sequence. Therefore you must leave the menu after setting a block marker, and return to it to print or delete the block.

Standing orders can be set up so that they can be added to the relevant accounts monthly – on a fixed date or on the last day of any month – or annually. The data entered is almost identical to that for ordinary transactions except that the account and 'who/to/from' fields are replaced by a who to field and a who from field, one of which must be an account name.

To save time in entering data in any name field pressing F2 will scroll alphabetically forward through the names which the program already recognises for that field; F1 scrolls backwards; and F3 erases the data in any field.

A comprehensive analysis section allows you to select any combination of class, accounts, debtors and creditors, and descriptions. In addition any of those can be assigned to any one of up to eight groups. For example, if you give gas, electricity, rates and water rates the same group number you can see what you are paying for all your services.

Mike Wright

Publisher Sinclair Research
Price £24.95
★★★★★

more business software on page 80

Histo-graph

PRESENTATION is an important part of any business when it comes to making a sales pitch or a plea to the bank manager. A visual presentation such as a graph will often make that point clearly.

Histo-graph from Transform is a program which will design bar charts – histograms – and pie charts and print them either on a full-sized printer or a ZX printer.

The program allows you to create up to five sets of data in memory at any one time. Each data set represents one year. In creating a set of data you are asked for a name, a maximum value and a minimum value, the paper and graph colours. Each graph can be shaded in one of three ways.

As the program does not allow the maximum value to be reset downwards it is easier to enter a value below the maximum you are likely to need and to allow the self-scaling feature of the program to adjust it. An interesting bug – it would be a feature if it was documented – adjusts a minimum greater than zero to be treated as the negative value; entering any minimum of 10 actually enters −10. That means that any graph with only positive values must be drawn between zero and the maximum. That produces odd looking graphs if the values are, for example, between 2000 and 2500.

Unlike most graph drawing programs **Histo-graph** draws the graph as data is entered. A cursor is used to show which bar will be drawn. Once entered, data can be changed easily by repositioning the cursor and entering the new number. It can also be redrawn as a pie chart.

Initially, the bar names are the abbreviated months – Jan, Feb, Mar – but those can be altered to your own names. There is room at the left of the graph for entering your own text, or the actual values, total and average can be displayed. The values on the vertical axis can be overwritten by the text, while deleting lines of text causes these values to be moved up a line.

For those with colour displays the paper and graph colours can be changed. However, with the Tasman interface and Epson FX80 you can only print graphs which are drawn in black and white.

Two useful features allow a direct comparison of up to three sets of data by drawing all the Jan values together, followed by the Feb values and so on. Alternatively, up to five sets can be drawn one after the other.

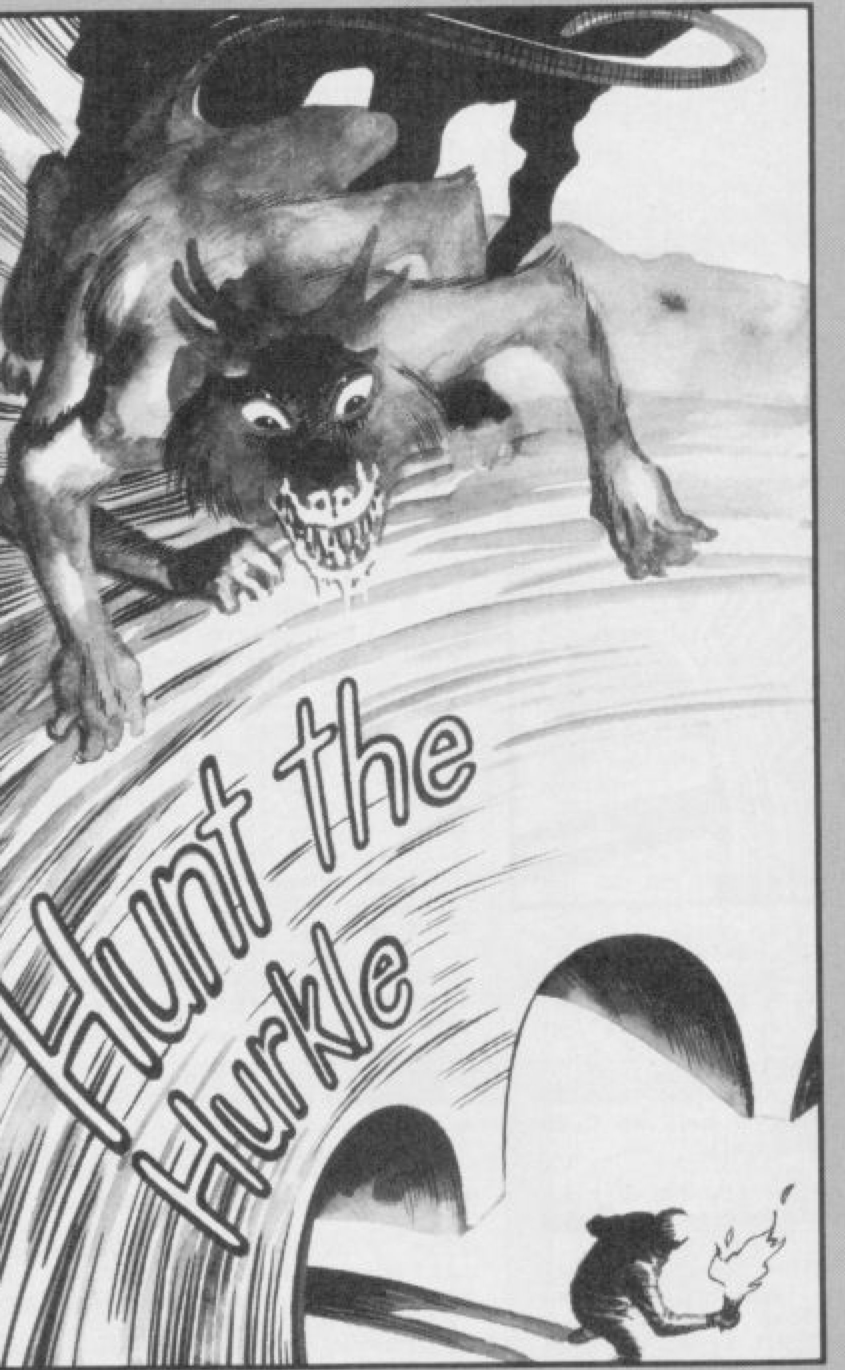
All the data, or data for any single graph, can be saved and reloaded. Although reloading data overwrites existing data, the set overwritten by a single graph can be selected. **Histo-graph** can be saved directly to microdrive.

Competition for **Histo-graph** comes from McGraw-Hill's **Projector 1** which is much more powerful, allowing line graphs and pages of key points to be prepared. The points and graphs can then be run sequentially to form a visual presentation. That program is not as easy to use and cannot be converted to microdrive easily.

The attraction of **Histo-graph** lies in its ease of use and the methods of display, which are totally different to **Projector 1**. If you prepare a lot of graphs then you may wish to have both, although you might feel that **Histo-graph** is overpriced. *Mike Wright*

Publisher Transform **Price** £10.95
Memory 48K
★★★

PROGRAM PRINTOUT



GRAPHICS INSTRUCTIONS

IN GENERAL, graphics abbreviations are enclosed in brackets, which should not be entered. A string of the same graphics character is represented in the form (3*A) which would be entered as AAA, where A is the graphics character. A space, where it is important to have the correct number of spaces, is indicated by (sp). Spaces in text will not normally be indicated. Where several graphics characters are used, they are separated by commas, which should not be entered. With Spectrum and QL listings the letter l has a flat top and the numeral 1 has a sloping top.

The above applies to all Sinclair machines. The following instructions are for specific machines.

ZX-81: ZX-81 listings are generally reproduced as they appear when you enter them, spaces and al!. Where extensive graphics are used, REM statements will be inserted to provide a guide to the position of each character.

Spectrum: User-defined graphics are represented by underlined letters, without brackets. Type the appropriate letter while in graphics mode. The underline does not appear on the screen. Inverse characters have the letter i before them, e.g. iZ, iA, iP. Block graphic characters are indicated by g followed by the number of the appropriate key: g4 would mean the block graphics on key 4, ig4 the inverse of that graphic.

Control codes are indicated by cc before the character, and are obtained by pressing CAPS SHIFT while in extended mode. They do not appear on the screen but may change the colour of the cursor and will affect what is printed after them: cc3,i* would thus have the effect of printing an inverse asterisk in red.

QL: User-defined graphics on the QL are indicated by a description of the keys pressed to obtain them, underlined and in brackets. Thus (CTRL + 9) means press CTRL and 9 together. The same applies for unusual characters within the QL character set, which our printer is unable to reproduce.

THE HURKLE is a mythical beast from the dawn of computer games. He inhabits a grid, and you must input co-ordinates to flush him out. Richard Hartill of Tarporley, Cheshire has written a version for the 48K Spectrum or Spectrum Plus which includes 10 versions of the game, depending on what sort of clues you get when you miss.

Apart from being lots of fun to play, it's also an ideal way to accustom a child to concepts such as vectors, bearings, and directions. Real brains will find the versions where the Hurkle actually moves about his grid much more challenging.

The program uses our special abbreviations for graphics characters, so please read the instructions above before typing in the listing.

```
   1 GO SUB 5000
   2 POKE 23561,0: POKE 23562,0
   3 REM ***HUNT THE HURKLE***
   4 REM Richard Bennett 1985
   5 BEEP .5,15: PRINT#1;AT 0,0
; INK 0; PAPER 5; BRIGHT 1;"Pres
s (iZ) to COPY or (iC) to CONTIN
UE"
   6 LET k$=INKEY$: IF k$="" THE
N  GO TO 6
   7 IF k$="z" OR k$="Z" THEN  B
EEP .1,15: COPY : GO TO 10
   8 IF k$<>"c" AND k$<>"C" THEN
  BEEP .5,0: GO TO 6
   9 BEEP .1,15
  10 LET g=1: LET t=0: LET f=0:
GO SUB 90
  20 PRINT AT 8,0;" Do you requi
re instructions?"
  25 PRINT AT 10,8;" (iY)es or (
iN)o? "
  30 LET k$=INKEY$: IF k$="" THE
N  GO TO 30
  31 BEEP .1,15
  35 IF k$="N" OR k$="n" THEN  G
O TO 100
  40 IF k$<>"Y" AND k$<>"y" THEN
  BEEP .5,0: GO TO 30
  50 CLS : GO SUB 91
  52 PRINT AT 8,0;" The Dreaded,
 Deadly Hurkle"
  54 PRINT AT 10,15; INK 7; PAPE
R 2; BRIGHT 1;"DE(sp)";AT 11,15;
"FJG";AT 12,15;"HIK"
  56 PRINT AT 14,0;" is hiding s
omewhere on a grid   like this :
-"
  58 GO SUB 95
  60 GO SUB 1000: GO SUB 95
  62 GO SUB 90
  64 PRINT AT 4,0;" You must try
 to work out where  he is hiding
 by typing in       guesses like
 this:-"
  66 PRINT AT 8,10; FLASH 1;"( 4
 , 5 )"
  68 PRINT AT 10,0;" These are c
alled co-ordinates"
  70 GO SUB 95: GO SUB 1000: LET
 x=4: LET y=5: LET c$="(cc9)BANG
(cc8)": GO SUB 3000: GO SUB 95
  72 GO SUB 90
  74 PRINT AT 4,0;" You are give
n various clues as  to how far o
ut your guess is    from the Hur
kle's hiding place."
  76 PRINT AT 8,0;" You can choo
se which sort of    clues you ar
e given from this   menu."
  78 GO SUB 95: LET f=1: GO SUB
100: LET f=0: GO SUB 95: GO SUB
90
  80 PRINT AT 8,0;" But the best
 way of finding out how to play
is by playing."
  82 PRINT AT 12,0;" If you are
a complete beginner  then start
with (i1) on the clues  menu."
  84 GO SUB 95: GO TO 100
  90 BORDER 0: PAPER 0: INK 7: C
LS
  91 PRINT AT 0,0; INK 6;"(isp,i
H,isp,iU,isp,iN,isp,iT,isp*3,iT,
isp,iH,isp,iE,isp*3,iH,isp,iU,is
p,iR,isp,iK,isp,iL,isp,iE,isp)":
 RETURN
  95 PAUSE 100: PRINT #1;AT 1,6;
 BRIGHT 1; FLASH 1;"Press (iC) t
o continue"
  96 LET k$=INKEY$: IF k$="" THE
N  GO TO 96
  97 IF CODE INKEY$<>67 AND CODE
 INKEY$<>99 THEN  BEEP .5,0: GO
TO 96
  98 BEEP .1,15: RETURN
```

continued on page 86



continued from page 85

```
 100 REM ***** M E N U *****
 101 BORDER 6: PAPER 6: INK 0: B
RIGHT 1: CLS
 105 PRINT AT 0,0; INK 6;"(isp,i
H,isp,iU,isp,iN,isp,iT,isp*3,iT,
isp,iH,isp,iE,isp*3,iH,isp,iU,is
p,iR,isp,iK,isp,iL,isp,iE,isp)"
 110 PRINT AT 1,0;"Which sort of
 clues do you want?"
 112 PRINT  BRIGHT 0;"(32*sp)"
 115 PRINT " (i1) Hurkle shown -
 HIT or MISS"
 120 PRINT '" (i2) WARM / COLD"
 125 PRINT '" (i3) How many unit
s away."
 130 PRINT '" (i4) Direction ( N
,S,NE,SW etc. )"
 135 PRINT '" (i5) Bearing."
 140 PRINT '" (i6) Vectors."
 145 PRINT '" (i7) Moving Hurkle
 - WARM/COLD"
 150 PRINT '" (i8) Moving Hurkle
 - Units away"
 155 PRINT '" (i9) Moving Hurkle
 - Directions"
 160 PRINT '" (i0) Moving Hurkle
 - Bearings."
 161 IF f=1 THEN  RETURN
 165 PRINT #1;AT 1,7; BRIGHT 1;"
 Choose your clues"
 170 LET k$=INKEY$: IF k$="" THE
N  GO TO 170
 180 IF CODE k$>57 OR CODE k$<48
 THEN  BEEP .5,5: GO TO 170
 181 LET t=VAL k$: IF t=0 THEN
LET t=10
 185 BEEP .1,15: IF t<4 OR t=7 O
R t=8 THEN  GO TO 500
 190 BORDER 2: PAPER 2: INK 7: C
LS
 200 REM *** Origin of clues **
 201 PRINT AT 0,0; INK 6;"(21*is
p,iH,isp,iU,isp,iN,isp,iT,isp*3,
iT,isp,iH,isp,iE,isp*3,iH,isp,iU
,isp,iR,isp,iK,isp,iL,isp,iE,34*
isp)"
 205 PRINT AT 7,0;" Do you want
your clues to:-"
 210 PRINT AT 10,0;" (iG) Point
from (iG)uess to Hurkle"
 215 PRINT AT 13,0;" (iH) Point
from (iH)urkle to your       las
t guess?"
 220 PRINT AT 18,7; INVERSE 1; B
RIGHT 1;" Make your choice "
 230 LET k$=INKEY$: IF k$="" THE
N  GO TO 230
 231 LET k=CODE k$
 235 IF k<97 THEN  LET k=k+32: L
ET k$=CHR$ k
 240 IF k<103 OR k>104 THEN  BEE
P .5,10: GO TO 230
 250 BEEP .1,15: LET t$=k$
 500 REM ***CONTROL LOOP***
 505 REM *********************
 510 GO SUB 900
 515 LET g=1
 520 GO SUB 1000
 530 GO SUB 1500
 540 IF x=hx AND y=hy THEN  GO T
O 3300
 550 GO SUB 2000
 570 GO SUB 3000
 580 LET g=g+1: IF g=11 THEN  GO
 TO 3400
 590 GO TO 530
 900 LET hx=INT (RND*9)
 910 LET hy=INT (RND*9)
 920 RETURN
1000 REM **Set up grid**
1001 REM ****************
1005 BORDER 4: PAPER 5: INK 0: C
LS
1015 PRINT AT 0,0; BRIGHT 1;"(22
*sp)"
1016 PRINT AT 1,23;"(iH,iU,iN,iT
,isp,iT,iH,iE)";AT 2,23;"(isp,iH
,iU,iR,iK,iL,iE,isp)";AT 4,22;"G
uessCClue";AT 5,22;"BBBBBABBBB"
1017 FOR k=6 TO 16: PRINT AT k,2
7;"C": NEXT k
1018 PRINT AT 17,22;"BBBBBABBBB"
1019 PRINT AT 1,0;
1020 FOR K=1 TO 9
1025 PRINT  INK 2; BRIGHT 1;"(sp
)"; INVERSE 1;10-K; INVERSE 0; I
NK 1;"ABABABABABABABABABA(sp)"
1030 PRINT  INK 1; BRIGHT 1;"(2*
sp,C,sp,C,sp,C,sp,C,sp,C,sp,C,sp
,C,sp,C,sp,C,sp,C,sp)"
1035 NEXT k
1040 PRINT  BRIGHT 1; INK 2;"(sp
,i0)"; INK 1;"ABABABABABABABABAB
Asp)"
1045 PRINT  BRIGHT 1; INK 2;"(2*
sp,i0,sp,i1,sp,i2,sp,i3,sp,i4,sp
,i5,sp,i6,sp,i7,sp,i8,sp,i9,sp)"
1050 PRINT  BRIGHT 1;"(22*sp)"
1060 IF t<>1 THEN  RETURN
1070 PRINT AT 18-(hy*2),1+(hx*2)
; INK 7; PAPER 2; BRIGHT 1;"(DEs
p)";AT 19-(hy*2),1+(hx*2);"FJG";
AT 20-(hy*2),1+(hx*2);"HIK"
1080 RETURN
1500 REM ***Type in guess****
1501 PRINT #1;AT 1,1; PAPER 5; B
RIGHT 1;"Please type in guess nu
mber ";g
1505 LET l=25: PRINT AT 19,23;"(
(sp,i?,sp),(3*sp))"
1510 LET k$=INKEY$: IF k$="" THE
N  GO TO 1510
1520 IF CODE k$<58 AND CODE k$>4
7 AND l<33 THEN  BEEP .1,15: GO
TO 1560
1525 IF CODE k$=13 AND l=33 THEN
  BEEP .1,15: GO TO 1600
1530 IF CODE k$<>12 THEN  BEEP .
5,10: GO TO 1510
1531 BEEP .1,15
1535 IF l=25 THEN  BEEP .5,10: G
O TO 1510
1540 IF l=33 THEN  PRINT AT 19,2
9; FLASH 1;"?": LET l=29: PRINT
AT 20,22;"(10*sp)";AT 21,22;"(10
*sp)": GO TO 1510
1550 GO TO 1505
1560 PRINT AT 19,l; INK 2; FLASH
 1;k$
1570 IF l=25 THEN  LET x=VAL k$:
 PRINT AT 19,29; FLASH 1;"?"
1580 IF l=29 THEN  LET y=VAL k$:
 PRINT AT 20,22; FLASH 1; BRIGHT
 1;"Press DEL.";AT 21,22;" or EN
TER "
1590 LET l=l+4: GO TO 1510
1600 PRINT AT 20,22;"(10*sp)";AT
 21,22;"(10*sp)"
1610 RETURN
2000 REM **Work out clue**
2020 IF t<7 THEN  GO TO 2000+(50
*t)
2025 GO TO 1750+(t*50)
2050 LET c$="MISS": RETURN
2100 LET d=ABS (hx-x)+ABS (hy-y)
2105 IF d>10 THEN  LET c$="FRIZ"
: RETURN
2110 GO SUB 2130+d
2115 IF t<7 THEN  RETURN
2120 GO TO 2500
2131 LET c$="FIRE": RETURN
2132 LET c$="VHot": RETURN
2133 LET c$="HOT!": RETURN
2134 LET c$="hot": RETURN
2135 LET c$="WARM": RETURN
2136 LET c$="glow": RETURN
2137 LET c$="COLD": RETURN
2138 LET c$="Brrr": RETURN
2139 LET c$="VCol": RETURN
2140 LET c$="ICY": RETURN
2150 LET d=ABS (hx-x)+ABS (hy-y)
2155 IF d<10 THEN  LET c$="(2*sp
)"+STR$ d: GO TO 2115
2160 LET c$="(sp)"+STR$ d
2165 GO TO 2115
2200 LET c$="(sp)": IF t$="h" TH
EN  GO TO 2230
2205 IF y<hy THEN  LET c$=c$+"N"
2210 IF y>hy THEN  LET c$=c$+"S"
2215 IF x<hx THEN  LET c$=c$+"E"
2220 IF x>hx THEN  LET c$=c$+"W"
2225 GO TO 2248
2230 IF y<hy THEN  LET c$=c$+"S"
2235 IF y>hy THEN  LET c$=c$+"N"
2240 IF x<hx THEN  LET c$=c$+"W"
2245 IF x>hx THEN  LET c$=c$+"E"
2248 IF t>6 THEN  GO TO 2500
2249 RETURN
2250 LET c=0: LET dx=hx-x: LET d
y=hy-y: LET ax=ABS dx: LET ay=AB
S dy
2251 IF dx=0 OR dy=0 THEN  GO TO
 2254
2252 LET c=INT (((ATN (ay/ax))/P
I)*180)
2254 IF dx>=0 AND SGN dy=1 THEN
 LET c=c+0: GO TO 2260
2255 IF dx>0 AND dy<=0 THEN  LET
 c=c+90: GO TO 2260
2256 IF dx<=0 AND SGN dy=-1 THEN
  LET c=c+180: GO TO 2260
2257 IF SGN dx=-1 AND dy>=0 THEN
  LET c=c+270
2260 IF t$="h" AND c<=180 THEN
LET c=c+180: GO TO 2265
2261 IF t$="h" AND c>180 THEN  L
ET c=c-180
2265 IF c>=100 THEN  LET c$=(STR
$ c)+"L": GO TO 2290
2270 IF c<10 THEN  LET c$="(2*sp
)"+STR$ c+"L": GO TO 2290
2275 LET c$="(sp)"+STh$ c+"L"
2290 IF t>6 THEN  GO TO 2500
2295 RETURN
2300 REM **VECTORS?**
2305 LET c$="": IF t$="h" THEN
LET dx=x-hx: LET dy=y-hy: GO TO
2320
2310 LET dx=hx-x: LET dy=hy-y
2320 IF dx>=0 THEN  LET c$="(sp)
"
2325 LET c$=c$+STR$ dx
2330 IF dy>=0 THEN  LET c$=c$+"(
sp)"
2335 LET c$=c$+STR$ dy
2340 IF t>6 THEN  GO TO 2500
2345 RETURN
2500 LET dx=0: LET dy=0: LET dx=
INT (RND*3)-1: IF dx<>0 THEN  GO
 TO 2530
2505 LET dy=INT (RND*3)-1
2530 IF hy+dy>=0 AND hy+dy<10 TH
```

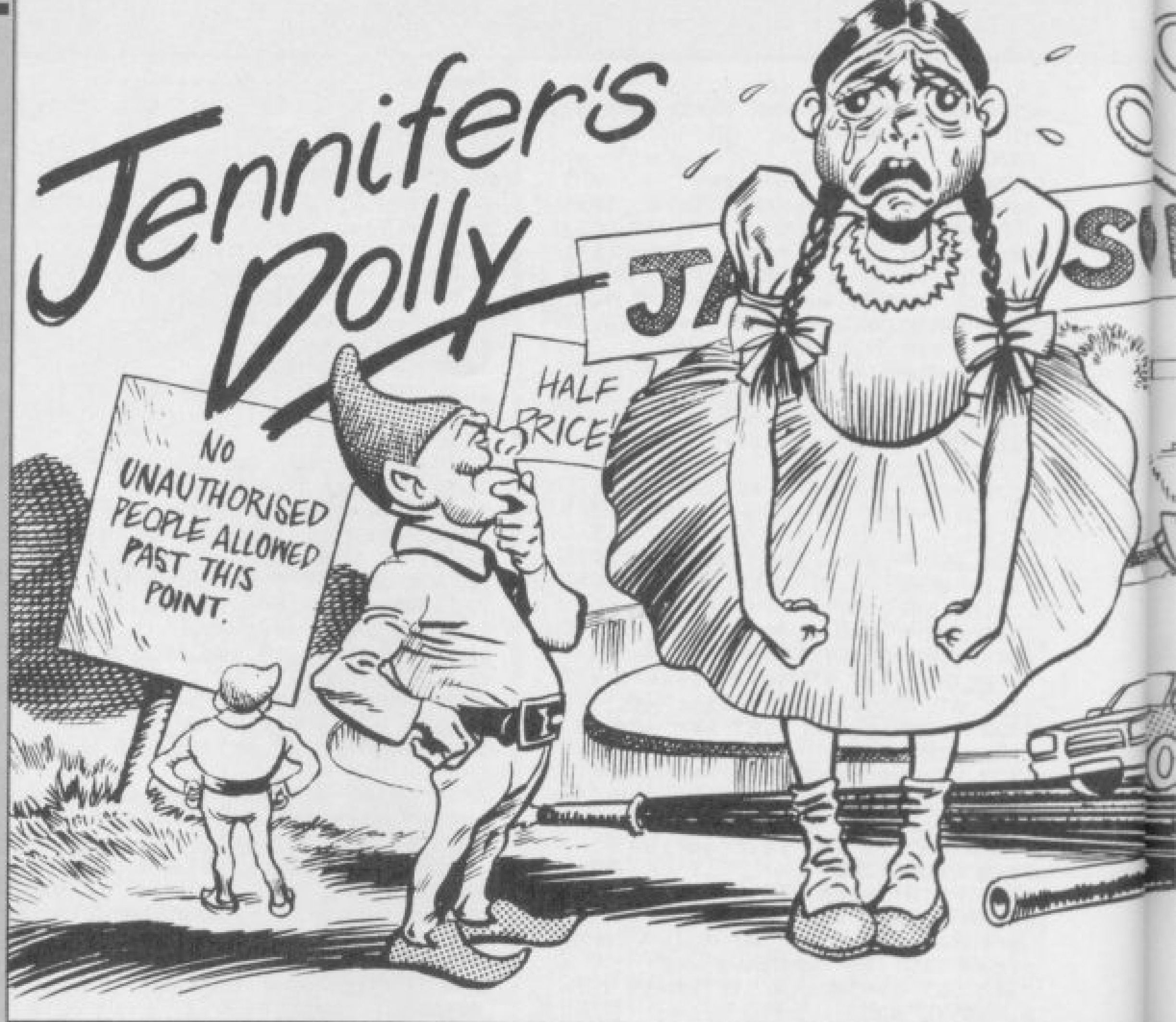
```
EN  LET hy=hy+dy
2540 IF hx+dx>=0 AND hx+dx<10 TH
EN  LET hx=hx+dx
2550 RETURN
3000 REM **Plot Guess**
3010 PRINT AT 5+g,22;"(";x;",";y
;")";AT 5+g,28;c$
3015 PRINT AT 19-(y*2),2+(x*2);
INK 2; PAPER 6; FLASH 1; BRIGHT
1;"M": BEEP 2,0
3020 PRINT AT 19-(y*2),2+(x*2);
INK 7; PAPER 2; BRIGHT 1;g
3050 RETURN
3300 REM **Direct hit!**
3310 LET c$="HIT!"
3315 PRINT AT 5+g,22;"(";x;",";y
;")";AT 5+g,28;c$
3320 PRINT AT 19-(y*2),2+(x*2);
INK 2; PAPER 6; FLASH 1; BRIGHT
1;"M"
3321 BEEP .3,8: BEEP .3,8: BEEP
.3,8: BEEP .3,8: BEEP .4,4: BEEP
 .2,8: BEEP 1,11
3325 PRINT AT 18-(y*2),1+(x*2);
INK 7; PAPER 2; BRIGHT 1; FLASH
1;"DE(sp)";AT 19-(y*2),1+(x*2);"
FJG";AT 20-(y*2),1+(x*2);"HIK"
3326 IF g=1 THEN  LET s$="(2*sp)
": GO TO 3330
3327 LET s$="es"
3330 PRINT #1;AT 1,0;"(2*sp)"; B
RIGHT 1; PAPER 6; INK 2;" You hi
t the hurkle in ";g;" go";s$
3340 PAUSE 200
3350 PRINT #1;AT 0,1; BRIGHT 1;
PAPER 6; INK 0;"  Press (iZ) for
 printer copy    ";AT 1,1;"  or
press (iC) to continue         "
3355 LET k$=INKEY$: IF k$="" THE
N  GO TO 3355
3360 IF k$="z" OR k$="Z" THEN  B
EEP .1,15: COPY : GO TO 3500
3365 IF k$<>"c" AND k$<>"C" THEN
  BEEP .5,0: GO TO 3355
3370 BEEP .1,15
3375 GO TO 3500
3400 REM **Missed!****
3401 REM ******************
3402 FOR k=16 TO -16 STEP -1: BE
EP .05,k: NEXT k
3403 PRINT #1;AT 1,1; INK 0; PAP
ER 5; BRIGHT 1; FLASH 1;"  He wa
s hiding at ( ";hx;"(sp),(sp)";h
y;"(sp))(sp)"
3405 PRINT AT 18-(hy*2),1+(hx*2)
; INK 7; PAPER 2; BRIGHT 1; FLAS
H 1;"DE ";AT 19-(hy*2),1+(hx*2);
"FJG";AT 20-(hy*2),1+(hx*2);"HIK
"
3410 LET c$="HERE"
3420 PRINT AT 5+g,22; BRIGHT 1;
FLASH 1;"(";hx;",";hy;")";AT 5+g
,28;c$
3425 PAUSE 500: GO TO 3350
3500 REM *** Game over ***
3505 REM ******************
3510 PAPER 6: INK 0: BORDER 6: B
RIGHT 1: CLS
3515 PRINT AT 0,0; PAPER 0; INK
7;"(30*isp,iH,isp,iU,isp,iN,isp,
iT,isp*3,iT,isp,iH,isp,iE,isp*3,
iH,isp,iU,isp,iR,isp,iK,isp,iL,i
sp,iE,34*isp)"
3520 PRINT AT 5,7; FLASH 1; INK
2;"G A M E   O V E R"
3525 PRINT AT 7,0;" Do you want
:-"
3530 PRINT '" (i1) Play the game
 again with the    same clues?"
3535 PRINT '" (i2) Choose a game
 with different    clues?"
3540 PRINT '" (i3) Finish playin
g Hunt the         Hurkle all to
gether?"
3545 PRINT AT 20,8; BRIGHT 1; FL
ASH 1;"Make your choice"
3550 LET k$=INKEY$: IF k$="" THE
N  GO TO 3550
3555 BEEP .1,15
3560 IF CODE k$<49 OR CODE k$>51
 THEN  BEEP .5,0: GO TO 3550
3565 GO TO 3560+(VAL k$*10)
3570 PRINT AT 9,1; BRIGHT 1; FLA
SH 1; INK 2;"1": PAUSE 150: GO T
O 500
3580 PRINT AT 11,1; BRIGHT 1; FL
ASH 1; INK 2;"2": PAUSE 150: GO
TO 100
3590 PRINT AT 13,1; BRIGHT 1; FL
ASH 1; INK 2;"3": PAUSE 150
3600 REM ***Over and out***
3605 REM ******************
3610 CLS
3615 PRINT AT 10,0; FLASH 1; PAP
ER 0; INK 7;"ARE YOU SURE YOU WA
NT TO FINISH?"
3620 PRINT AT 12,10;" (iY)es or
(iN)o?"
3625 LET k$=INKEY$: IF k$="" THE
N  GO TO 3625
3630 BEEP .1,15
3635 IF k$="y" OR k$="Y" THEN  R
ANDOMIZE USR 0
3640 IF k$="n" OR k$="N" THEN  G
O TO 3500
3645 BEEP .5,0: GO TO 3625
5000 REM *** U D G s *****
5001 REM *****************
5010 FOR k=65368 TO 65471
5015 READ a: POKE k,a
5020 NEXT k
5025 RETURN
5050 DATA 24,24,24,255,255,24,24
,24
5052 DATA 0,0,0,255,255,0,0,0
5054 DATA 24,24,24,24,24,24,24,2
4
5056 DATA 0,0,16,56,84,16,16,16
5058 DATA 24,24,24,0,0,85,85,127
5060 DATA 16,16,48,175,175,48,16
,16
5062 DATA 120,48,48,243,243,0,0,
0
5064 DATA 16,16,16,19,19,0,0,0
5066 DATA 99,99,99,227,247,0,0,2
4
5068 DATA 127,73,91,255,201,65,8
5,127
5070 DATA 0,0,0,240,240,0,0,0
5072 DATA 48,72,72,48,0,0,0,0
5074 DATA 0,73,42,0,99,0,42,73
```

A COMPACT version of the popular board game, **Connect 4** was written by R Hartill of Rhydyfelin, Glamorgan, It's a two player game for the QL, and involves dropping discs into a grid to make four in a row — up, down or diagonally. It's also a good example of how to maximise the QL's strengths to produce a good game in a very short space.




```
100 DIM disc(7,6),d(20,20),c$(2,
8):again=0:won=0:POKE_W 163976,0
110 FOR n=1 TO 7:FOR r=1 TO 6:di
sc(n,r)=0:NEXT r:NEXT n
120 FOR n=1 TO 10:FOR r=1 TO 8:d
(n,r)=0:NEXT r:NEXT n
130 pl=2:MODE 8:c$(1)=" yellow "
:c$(2)=" red "
140 INK 5:PAPER 1:CLS:FOR n=20 T
O 140 STEP 20
150 FOR r=8TO 100 STEP 17:FILL 1
:CIRCLE n,r,7:NEXT r:NEXT n:REPe
at w
160 CLS#0:CSIZE#0,3,1:IF pl=2:pl
=1:ELSE pl=2
170 FOR l=1 TO 7:k=((55*l))-10:C
URSOR#0,k,1:PRINT#0,l;
180 CSIZE#0,3,0:AT#0,2,0:PRINT#0
;"PLAYER 1 ("!c$(pl)!")";:REPeat
 p
190 m=CODE(INKEY$)-48:SELect ON
m :=1TO 7:CLS#0,3:c pl,m:EXIT p:
END SELect
200 END REPeat p:FOR k=1TO 7:IF
disc(k,6)=0:END REPeat w:ELSE NE
XT k:ak
210 DEFine PROCedure c (pl,ROW):
IF pl=1:i=6:ELSE i=2
220 IF disc(ROW,6):BEEP 30000,20
0:IF pl=1:pl=2:RETurn :ELSE pl=1
:RETurn
230 sm=0:FOR n=1 TO 6:IF disc(RO
W,n)=1:sm=n
240 x=ROW*20:up=8:FOR n=1 TO 6:I
F disc(ROW,n)=1:up=up+17
250 FOR a=93 TO up+17 STEP -17:I
NK i:FILL 1:CIRCLE x,a,7:INK 5:C
IRCLE x,a,7
260 INK i:FILL 1:CIRCLE x,up,7:P
RINT#0:BEEP 1000,4
270 disc(ROW,sm+1)=1:d(ROW+3,sm+
4)=pl:CFw:END DEFine
280 DEFine PROCedure CFw:FOR n=4
 TO 11
290 FOR r=4 TO 10
300 FOR v=1,2:IF d(n+3,r):IF d(n
,r)=v AND d(n+1,r)=v AND d(n+2,r
)=v AND d(n+3,r)=v:won=v:ak
310 FOR k=-1,0,1:FOR v=1,2:IF d(
n+(k*3),r+3)=v:IF d(n,r)=v AND d
(n+k,r+1)=v AND d(n+(k*2),r+2)=v
 AND d(n+(k*3),r+3)=v:won=v:ak:E
LSE NEXT v:NEXT k
320 NEXT r:NEXT n:END DEFine
330 DEFine PROCedure ak:BEEP 300
00,1:PAUSE 30:BEEP 30000,50:PAUS
E 100
```

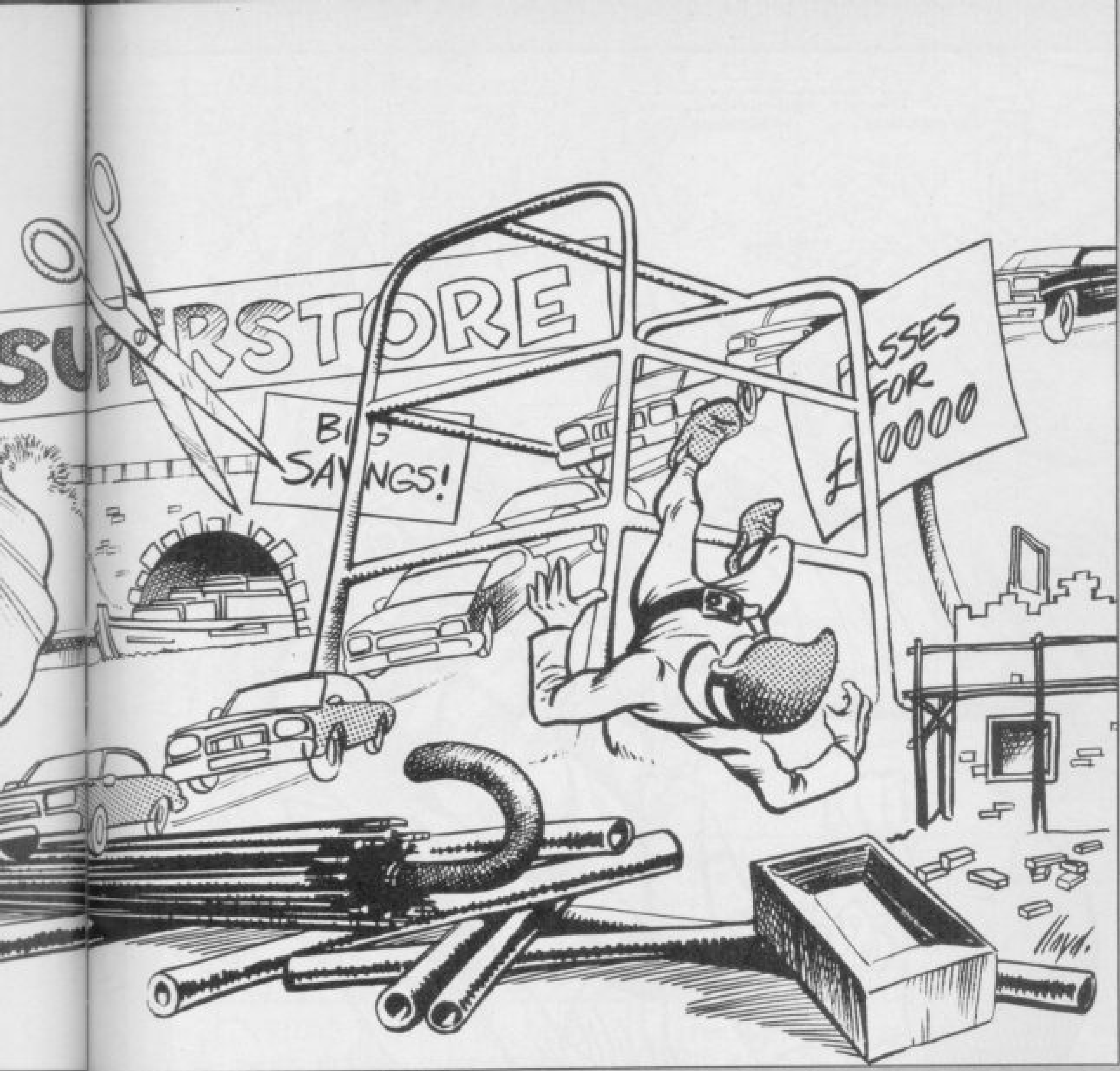
Jennifer's Dolly



FIND Jennifer's dolly before she brings down the house with her miserable tantrums. You play one of Santa's dwarfs in this whimsical text adventure by Timothy Sneath of Godmanchester, Cambridge. What is the secret of the awful supermarket? Where can you use the umbrella?

Jennifer's Dolly was written for the 48K Spectrum or Spectrum Plus, and accepts the usual two-word commands so beloved of veteran adventurers.

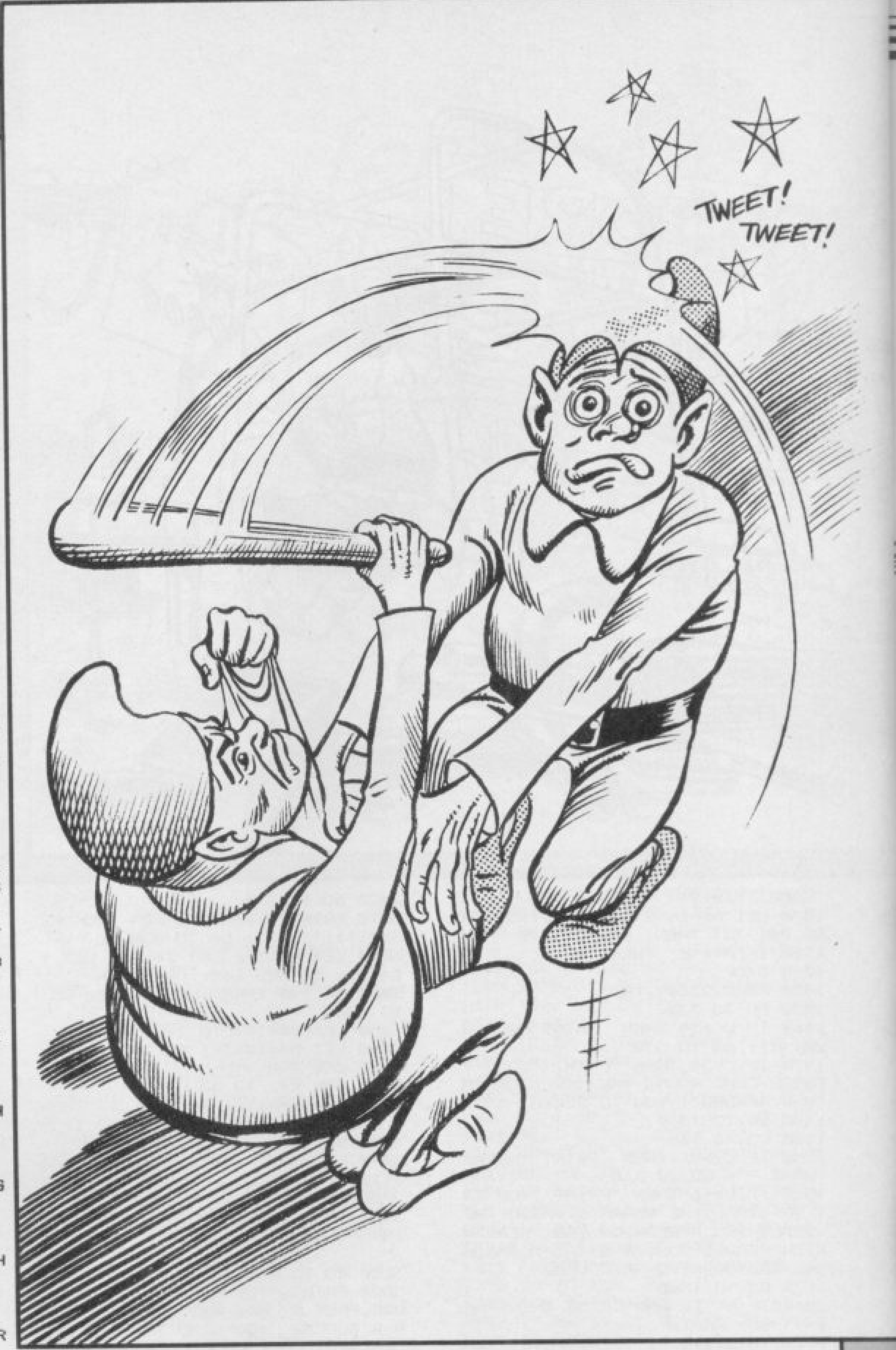
```
  10 RUN 15
  15 PAPER 7: BORDER 7: INK 0: C
LS
  20 DIM G(16,6): POKE 23658,8
  30 FOR N=1 TO 6: FOR M=1 TO 16
: READ G(M,N): NEXT M: NEXT N
  40 DATA 0,0,5020,0,0,0,0,5040,
5070,5100,5140,5170,0,0,5200,523
0
  50 DATA 5260,5280,0,0,5310,534
0,0,0,0,0,0,5370,0,0,0,0
  60 DATA 0,5400,0,0,0,0,5430,54
60,0,0,5490,5510,5540,5570,5590,
5620
  70 DATA 0,0,5650,5680,5720,573
0,0,0,0,5760,5780,0,0,0,0,5800
  72 DATA 5820,0,0,0,0,5840,5860
,0,0,0,0,0,0,0,0,0
  75 DATA 1010,1150,1240,1310,14
10,1460,1500,1360,1080,1550,3110
,2000,2200,2400,2600,2800
  80 CLS : PRINT "DO YOU WANT IN
STRUCTIONS ?"
  90 LET A$=INKEY$: IF A$="" THE
N  GO TO 90
  95 IF A$="Y" THEN  GO SUB 6000
 100 CLS : LET DOLL=0: LET PASS=
0
 120 DIM R$(36,40): DIM R(36)
 130 FOR K=1 TO 36: READ R$(K),R
(K): NEXT K
 140 DATA "NOISE",5,"RIP",6,"TEA
R",6,"LOOK",7,"RECAP",7,"QUIT",8
,"STOP",8,"END",8,"FINISH",8,"IN
VENTORY",9,"I",9,"INV",9,"INVENT
",9,"STEAL",10,"ROB",10,"SNATCH"
,10,"HELP",11,"HINT",11,"LIST",9
,"GET",2,"TAKE",2,"CARRY",2,"PUT
",3,"LEAVE",3,"DROP",3,"BORROW",
4,"BUY",12,"CLIMB",13,"EXAMINE",
14,"CHECK",14
 145 DATA "QUEST",15,"VOCAB",16
 150 DATA "NORTH",1,"SOUTH",1,"E
AST",1,"WEST",1
 170 READ NB
 180 DIM B(NB): DIM B$(NB,14): D
IM S$(NB,40)
 190 FOR I=1 TO NB: READ B(I),B$
(I),S$(I): NEXT I
 200 DATA 9,0,"PASS","A PASS IS
GIVEN TO YOU."
 210 DATA 0,"£10000","£10000 IS
PASSED OVER THE       COUNTER"
 220 DATA 21,"BRICK","A BRICK LI
ES ON THE GROUND."
 230 DATA 0,"ZX SPECTRUM","A ZX
SPECTRUM IS IN FRONT OF    YOU."
 240 DATA 0,"COMMODORE 64","A CB
M 64 IS IN FRONT OF YOU."
 250 DATA 0,"DOLL","A DOLL IS ON
 THE FLOOR"
 260 DATA 39,"UMBRELLA","AN UMBR
ELLA IS HERE."
 265 DATA 44,"LITTER","THERE IS
SOME LITTER ON THE BEACH."
 267 DATA 28,"SCISSORS","YOU SEE
 A PAIR OF SCISSORS."
 280 LET L=45
 290 GO TO 330
 310 CLS
 330 IF L<=16 THEN  GO SUB G(L,1
): GO TO 370
 335 IF L<=32 THEN  GO SUB G(L-1
6,2): GO TO 370
 340 IF L<=48 THEN  GO SUB G(L-3
2,3): GO TO 370
 350 IF L<=64 THEN  GO SUB G(L-4
8,4): GO TO 370
 355 IF L<=80 THEN  GO SUB G(L-6
4,5): GO TO 370
 370 FOR I=1 TO NB: IF B(I)=L TH
EN  PRINT S$(I)
 380 NEXT I
 400 PRINT "POSSIBLE ROUTES ARE:
-"
 410 IF N>0 THEN  PRINT TAB 11;"
NORTH"
 420 IF E>0 THEN  PRINT TAB 11;"
EAST"
 430 IF S>0 THEN  PRINT TAB 11;"
SOUTH"
 440 IF W>0 THEN  PRINT TAB 11;"
WEST"
 460 INPUT  INVERSE 1;"WHAT NOW
"; LINE I$
 470 GO SUB 3010
 510 IF I=0 THEN  GO TO 520
 515 GO TO G(I,6)
 520 PRINT '"I DON'T KNOW HOW TO
 ";V$: GO TO 370
 610 LET IN=0: IF LEN Y$>LEN X$
THEN  RETURN
 620 FOR K=1 TO (LEN X$-LEN Y$+1
)
 630 IF Y$=X$(K TO K+LEN Y$-1) T
HEN  LET IN=K: GO TO 650
 640 NEXT K
 650 RETURN
1010 IF I$="N" AND N>0 THEN  LET
 L=L-6: GO TO 310
1020 IF I$="E" AND E>0 THEN  LET
 L=L+1: GO TO 310
1030 IF I$="S" AND S>0 THEN  LET
 L=L+6: GO TO 310
1040 IF I$="W" AND W>0 THEN  LET
 L=L-1: GO TO 310
1060 PRINT "SORRY YOU CAN'T GO T
HAT WAY !!": GO TO 330
1080 PRINT "YOU HAVE: ";: LET IN
=0
1090 FOR G=1 TO NB
1100 IF B(G)=-1 THEN  PRINT TAB
10;B$(G): LET IN=IN+1
1110 NEXT G
1120 IF IN=0 THEN  PRINT "ZILCH"
1130 GO TO 330
1150 FOR G=1 TO NB
1160 IF N$=B$(G, TO LEN N$) THEN
 GO TO 1190
1170 NEXT G
1180 PRINT "I DON'T UNDERSTAND "
;N$: GO TO 330
1190 IF B(G)=-1 THEN  PRINT "YOU
'VE ALREADY GOT IT": GO TO 330
1200 IF B(G)<>L THEN  PRINT "IT
ISN'T HERE": GO TO 330
1210 PRINT "OK": LET B(G)=-1
1220 GO TO 330
1240 FOR G=1 TO NB
1250 IF N$=B$(G, TO LEN N$) THEN
 GO TO 1270
1260 NEXT G: PRINT "I DON'T UNDE
RSTAND ";N$: GO TO 330
1270 IF B(G)<>-1 THEN  PRINT "YO
U HAVEN'T GOT IT": GO TO 330
1280 PRINT "OK": LET B(G)=L
1290 GO TO 330
1305 IF L<>54 THEN  PRINT "BORRO
W WHAT ?": GO TO 330
1310 IF L=54 THEN  LET B(2)=54
1320 GO TO 330
1340 PRINT "WELL DONE,YOU'VE COM
PLETED THE  ADVENTURE"
1345 PAUSE 200: CLS
1350 GO SUB 7000
1355 PRINT AT 15,0;"HAPPY CHRIST
MAS TO ALL SINCLAIR USER READERS
 EVERYWHERE!"
1356 POKE 23692,255: GO SUB 7000
1357 FOR a=7 TO 0 STEP -1: FOR b
=7 TO 0 STEP -1: BORDER a: PAPER
 b: CLS : PRINT  INK 9;"BYEEE!":
 PAUSE 50: NEXT b: NEXT a: PAUSE
 500: RANDOMIZE USR 0
1360 PRINT '"DO YOU WANT ANOTHER
```




```
GAME (Y/N)?"
1370 LET A$=INKEY$: IF A$<>"Y" A
ND A$<>"N" THEN  GO TO 1370
1380 IF A$="Y" THEN  RUN
1390 STOP
1410 POKE 23609,10
1420 GO TO 330
1460 IF L<>34 THEN  PRINT "RIP W
HAT ?": GO TO 330
1470 IF L=34 THEN  PRINT "SOME Y
OBBOS COME ROUND THE        CORNER
 AND HEADBUTT YOU TO DEATH"
1480 GO TO 1360
1500 GO TO 330
1550 IF L<>46 THEN  PRINT "STEAL
 WHAT ?": GO TO 330
1560 IF L=46 THEN  PRINT "YOU TR
Y TO STEAL THE DWARF'S BAGBUT HE
 DEALS YOU A BLOW ON THE  HEAD W
HICH LEAVES YOU IN A       COMA.H
OWEVER,YOU NEVER RECOVER."
1570 GO TO 1360
2010 IF L<>18 AND L<>53 THEN  PR
INT "BUY WHAT ?"
2020 IF B(2)<>-1 THEN  PRINT "WH
ERE'S YOUR MONEY ?"
2030 IF L=18 AND B(2)=-1 THEN  P
RINT "YOU BUY THE PASS.": LET PA
SS=1: LET B(2)=0: LET B(1)=-1
2040 IF L=53 AND N$="COMMODORE 6
4" AND B(2)=-1 OR L=53 AND N$="C
BM 64" AND B(2)=-1 THEN  LET B(2
)=0: LET B(5)=53
2050 IF L=53 AND N$="SPECTRUM" A
ND B(2)=-1 THEN  LET B(2)=0: LET
 B(4)=53
2060 GO TO 330
2210 IF L=28 THEN  PRINT "YOU CL
IMB THE FRAME.OH DEAR,YOU FALL O
FF AND CRACK YOUR HEAD    OPEN O
N THE CONCRETE LYING BELOWIT.":
GO TO 1360
2220 PRINT "CLIMB WHAT ?": GO TO
 330
2410 IF L=71 AND B(6)=0 THEN  LE
T B(6)=L: LET DOLL=1: GO TO 330
2420 PRINT "EXAMINE WHAT ?": GO
TO 330
2610 GO SUB 6000
2620 GO TO 330
2810 PRINT "FIND OUT FOR YOURSEL
F!!!!!!!!!!!": GO TO 330
3010 LET N$="": LET X$=I$: LET Y
$=" ": GO SUB 600: LET I=IN
3020 IF I=0 THEN  LET V$=I$: GO
TO 3050
3030 LET V$=I$( TO I-1)
3040 LET N$=I$(I+1 TO )
3050 LET I=0
3060 FOR K=1 TO 36
3070 IF V$=R$(K, TO LEN V$) THEN
 LET I=R(K): LET I$=V$( TO 1)
3080 NEXT K
3090 RETURN
3110 IF L=53 OR L=18 THEN  PRINT
 "GO TO THE BANK."
3120 IF L<>53 AND L<>18 THEN  PR
INT "SORRY,I CAN'T HELP YOU HERE
."
3130 GO TO 330
5020 PRINT "YOU WALK UP TO THE D
OOR,PAST A  MAN WHO IS WORKING O
N A CLOCK.  YOU RING THE BELL.IT
 IS VERY    LOUD.A LADY OPENS TH
E DOOR.     ""HELLO"",SHE SAYS."
"I BELIEVE      YOU'RE LOOKING FO
R A DOLL AREN'TYOU?I SUGGEST YOU
 KNOCK ON NO.5.THERE IS A BOY AN
D A GIRL THERE WHO CAN HELP YOU
ON YOUR SEARCH.BY THE WAY,NO.1 I
S WHERE SARAH LIVES."".YOU WALK
 BACK UP THE     PATH.
                       YOU CAN:-
                       GO EAST TO
 NO.1,WEST TO    NO.5,OR SOUTH."
5025 LET L=9
5030 LET N=0: LET E=1: LET S=1:
LET W=1: RETURN
5040 IF DOLL=0 THEN  PRINT "YOU
HEAR SCREAMING OF ""I WANT    MY
DOLLY NOW!"".YOU DECIDE IT IS WI
SEST NOT TO KNOCK."
5042 IF DOLL=1 THEN  GO TO WINNE
R
5050 LET N=0: LET E=1: LET S=0:
LET W=0: RETURN
5070 PRINT "YOU ARE IN CHESTNUT
AVENUE.
          YOU CAN:-

        KNOCK AT NO.1(W)
        KNOCK AT NO.3(N)
   OR   KNOCK AT NO.5(E)"
5080 LET N=1: LET E=1: LET S=1:
LET W=1: RETURN
5100 PRINT "YOU ARE BESIDE A DOO
R,AND SOON ABOY OPENS THE DOOR."
"HELLO"",HE    SAYS.""HOW ARE YOU
 GETTING ON    WITH THE ADVENTURE
?YOU WILL NEEDTO GO ACROSS MY BR
IDGE.IT IS TO THE EAST."""
5120 LET N=0: LET E=1: LET S=0:
LET W=1: RETURN
5140 PRINT "YOU ARE IN A MUDDY A
IRFIELD."
5150 LET N=0: LET E=1: LET S=0:
LET W=1: RETURN
5170 PRINT "YOU ARE IN A MUDDY A
IRFIELD."
5180 LET N=0: LET E=0: LET S=1:
LET W=1: RETURN
5200 PRINT "YOU ARE IN SYCAMORE
ROAD."
5210 LET N=1: LET E=0: LET S=1:
LET W=0: RETURN
5230 PRINT "YOU ARE BY A BUSY MO
TORWAY AT A BRIDGE CROSSING OVER
 THE RIVER   DEABURY.THE BRIDGE S
EEMS ONLY TOBE MEANT FOR CARS ON
 THE          MOTORWAY.TO CROSS GO
 EAST."
5240 LET N=0: LET E=1: LET S=1:
LET W=0: RETURN
5260 PRINT "DO YOU OFTEN CROSS M
OTORWAYS?    YOU HAVE JUST BEEN S
QUASHED BY AFAST MOVING CAR.": G
O TO 1360
5280 PRINT "YOU SEE A STALL ADVE
RTISING      PASSES FOR £10000."
5290 LET N=1: LET E=0: LET S=0:
LET W=0: RETURN
5310 PRINT "YOU ARE IN OAK TREE
CRESCENT."
5320 LET N=1: LET E=1: LET W=0:
LET S=0: RETURN
5340 PRINT "YOU ARE AT THE NORTH
 END OF THE PARK,BY DEABURY LOCK
."
5350 LET N=1: LET E=0: LET S=1:
LET W=1: RETURN
5370 PRINT "YOU ARE BY THE CLIMB
ING FRAME.ITIS BROWN WITH RUST."
5380 LET N=1: LET E=0: LET S=1:
LET W=0: RETURN
5400 PRINT "YOU ARE BY THE SWING
S.THEY LOOK OLD AND RICKETY.YOU
SEE A POSTERSAYING ""VOTE CONSER
VATIVE"""
5410 LET N=1: LET E=0: LET S=1:
LET W=0: RETURN
5430 PRINT "YOU ARE BY SOME RED
BRICKED      HOUSES,NEAR A PARK.Y
OU CAN SEE   THE RIVER SOME DISTA
NCE OFF,AND YOU CAN HEAR THE BIR
DS CHIRPING IN SOME TREES."
5440 LET N=0: LET E=1: LET S=1:
LET W=0: RETURN
5460 PRINT "YOU ARE IN THE PARK,
BESIDE THE   RIVER.YOU FEEL CALM
AND RELAXED,AND CAN SEE A BARGE
PEACEFULLY   CHUGGING ALONG THE S
PARKLING     CANAL.STILL,YOU FEEL
 YOU MUST    GET GOING ON YOUR QU
EST."
5470 LET N=1: LET E=0: LET S=0:
LET W=1: RETURN
5490 PRINT "YOU ARE DROWNED!!!(H
A,HA!)": PRINT : GO TO 1360
5510 PRINT "YOU ARE BESIDE THE S
EA ON A      GOLDEN SANDY BEACH.T
HE SEA IS TOTHE WEST."
5520 LET N=0: LET E=1: LET S=0:
LET W=1: RETURN
5540 PRINT "YOU ARE AT SOME CROS
SROADS."
```

continued on page 90



continued from page 89

```
5550 LET N=1: LET E=1: LET S=1:
LET W=1: RETURN
5570 PRINT "YOU ARE IN THE TOWN
CENTRE.TO    THE EAST OF YOU,YOU
NOTICE A     PEDESTRIAN PRECINCT.
A FELLOW     DWARF,HOLDING A SHOP
PING BAG     WALKS UP TO YOU.""GO
OD DAY"",HE    SAYS IN A CHEERY V
OICE."
5580 LET N=0: LET E=1: LET S=1:
LET W=1: RETURN
5590 PRINT "YOU ARE IN A GAILY C
OLOURED       SHOPPING PRECINCT.A
BRIGHT GREENSIGN STANDS OUT OF T
HE REST,      ADVERTISING JAMES' S
UPERSTORE.   THAT IS TO THE SOUTH
."
5600 LET N=0: LET E=1: LET S=1:
LET W=1: RETURN
5620 PRINT "YOU ARE IN FRONT OF
A BANK KNOWNAS ""SUPERBANK"" WHI
CH IS TO THE  SOUTH."
5630 LET N=0: LET E=0: LET S=1:
LET W=1: RETURN
5650 PRINT "YOU ARE ON A BUILDIN
G SITE.THEREARE LOTS OF PIPES ST
REWN ALL      OVER THE GROUND."
5660 LET N=1: LET E=1: LET S=0:
LET W=0: RETURN
5680 PRINT "THERE IS A BARRIER H
ERE,WITH A  NOTICE BESIDE IT SAY
ING ""NO         UNAUTHORISED PEOPL
E ALLOWED PASTTHIS POINT."""
5690 LET N=1: LET E=0: LET W=1:
IF PASS=0 THEN  LET S=0
5700 IF PASS=1 THEN  LET S=1
5710 RETURN
5720 PRINT "YOU ARE INSIDE JAMES
'.A POSTER  ADVERTISES BOTH ZX S
PECTRUMS ANDCOMMODORE 64S FOR £1
0000 EACH.": LET N=1: LET E=0: L
ET W=0: LET S=0: RETURN
5730 PRINT "YOU ARE INSIDE THE B
ANK."
5740 LET N=1: LET E=0: LET W=0:
LET S=0: RETURN
5760 PRINT "YOU ARE IN AN UNFINI
NISHED       BUILDING."
5770 LET N=1: LET E=1: LET S=0:
LET W=0: RETURN
5780 PRINT "YOU ARE IN THE NORTH
 END OF THE GARDEN."
5790 LET N=0: LET E=0: LET S=1:
LET W=1: RETURN
5800 PRINT "YOU ARE IN THE LOUNG
E."
5810 LET N=1: LET E=1: LET S=1:
LET W=0: RETURN
5820 PRINT "YOU ARE IN THE SOUTH
 END OF THE GARDEN."
5830 LET N=1: LET E=0: LET S=1:
LET W=0: RETURN
5840 PRINT "YOU ARE IN THE BATHR
OOM."
5850 LET N=1: LET E=1: LET S=0:
LET W=0: RETURN
5860 PRINT "YOU ARE IN THE DININ
G ROOM."
5870 LET N=1: LET E=0: LET S=0:
LET W=1: RETURN
6020 PRINT "YOU ARE ONE OF SANTA
 CLAUS'      DWARF MESSENGERS WHO
HAS TO FINDOUT WHAT THE LITTLE
GIRLS AND    BOYS WOULD LIKE FOR
XMAS.YOU     HAVE FOUND OUT THAT
A GIRL OF    ABOUT 4 YEARS OF AGE
 HAS LOST    HER DOLL NAMED SARAH
.YOU FEEL    SORRY FOR THE GIRL A
ND GO OUT TOLOOK FOR THE DOLL.HO
WEVER,A TINYDWARF CAN EASILY GET
LOST,AND     THE DOLL IS ALMOST A
S BIG AS YOUARE YOURSELF!"
6040 PRINT AT 20,3;"PRESS ANY KE
Y TO CONTINUE"
6050 LET A$=INKEY$: IF A$="" THE
N  GO TO 6050
6060 RETURN
7000 GO TO 7040
7010 LET C=.3
7020 PRINT "We ";: BEEP c,a+2: P
RINT "wish ";: BEEP c,a+7: PRINT
 "you ";: BEEP c/2,a+7: PRINT "a
 ";: BEEP c/2,a+9: PRINT "mer";:
 BEEP c/2,a+7: PRINT "ry ";: BEE
P c/2,a+6: PRINT "Christ";: BEEP
 c,a+4: PRINT "mas,": BEEP c,a+4
7030 RETURN
7040 LET a=0: GO SUB 7010: LET a
=2: GO SUB 7010
7050 PRINT "We ";: BEEP c,2: PRI
NT "wish ";: BEEP c,11: PRINT "y
ou ";: BEEP c/2,11: PRINT "a ";:
 BEEP c/2,12: PRINT "mer";: BEEP
 c/2,11: PRINT "ry ";: BEEP c/2,
9: PRINT "Christ";: BEEP c,7: PR
INT "mas,": BEEP c,4
7060 PRINT "And ";: BEEP c/2,2:
PRINT "a ";: BEEP c/2,2: PRINT "
hap";: BEEP c,4: PRINT "py ";: B
EEP c,9: PRINT "new ";: BEEP c,6
: PRINT "year.": BEEP c*2,7
7070 PRINT : PRINT : PRINT : PAU
SE 10
7080 PRINT "Good ";: BEEP c,2: P
RINT "tid";: BEEP c,7: PRINT "in
gs ";: BEEP c,7: PRINT "we ";: B
EEP c,7: PRINT "bring": BEEP c*2
,6
7090 PRINT "To ";: BEEP c,6: PRI
NT "you ";: BEEP c,7: PRINT "and
 ";: BEEP c,6: PRINT "your ";: B
EEP c,4: PRINT "kin;": BEEP c*2,
2
7100 PRINT "We ";: BEEP c,9: PRI
NT "wish ";: BEEP c,11: PRINT "y
ou ";: BEEP c/2,9: PRINT "a ";:
BEEP c/2,9: PRINT "mer";: BEEP c
/2,7: PRINT "ry ";: BEEP c/2,7:
PRINT "Christ";: BEEP c,14: PRIN
T "mas,": BEEP c,2
7110 PRINT "And ";: BEEP c/2,2:
PRINT "a ";: BEEP c/2,2: PRINT "
hap";: BEEP c,4: PRINT "py ";: B
EEP c,9: PRINT "new ";: BEEP c,6
: PRINT "year.": BEEP c*3,7
7130 RETURN
```



GUIDE BENNY the mechanic through three screens of garage mayhem as an angry customer attempts to brain him with the spanners. **Manic Mechanic** was written by T Sherwood of West Bromwich, and runs on the 48K Spectrum or Spectrum Plus.

The program uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout before entering the listing.

```
   5 GO TO 7000
 105 FOR p=31 TO 0 STEP -.6
 110 FOR i=1 TO 2
 120 LET y1=y+(INKEY$="0" AND y<31)-(INKEY$="9" AND y>0)
 130 PRINT AT x,y;"(sp)";AT x,y1;a$(i);AT x+1,y;"(sp)";AT x+1,y1;b$(i): LET y=y1
 140 IF ATTR (x+3,y)<7 THEN  GO TO 1500
 210 LET b1=b+d
 215 IF b1<0 OR b1>31 THEN  LET b1=b: LET d=-d
 220 PRINT AT a,b;"(sp)";AT a+1,b;"(sp)"; INK 6;AT a,b1;c$(i);AT a+1,b1;b$(i): LET b=b1
 240 IF ATTR (x,y)=6 THEN  GO TO 5100
 250 IF ATTR (a+3,b)<7 THEN  GO TO 2000
 900 NEXT i
 910 PRINT AT 0,p;"(sp)": NEXT p
 950 GO TO 5100
1510 IF ATTR (x+3,y)=4 AND INKEY$="" THEN  GO TO 1600
1520 IF ATTR (x+3,y)=2 AND INKEY$="" THEN  GO TO 1700
1530 IF ATTR (x+3,y)=6 THEN  GO TO 1800
1599 GO TO 141
1610 POKE z+3,20: POKE z+5,40: POKE z+24,28
1630 FOR j=x TO x+3
1640 PRINT AT j,y;"(sp)";AT j+1,y;"C";AT j+2,y;"D"
1650 LET l=USR z: NEXT j
1660 LET x=j
1670 PRINT  INK 4;AT x-1,y;"H";INK 3;AT x-2,y;"O"
1699 GO TO 141
1705 POKE z+3,100: POKE z+5,3: POKE z+24,28
1710 FOR j=x-1 TO x-4 STEP -1
1715 PRINT AT j,y;"A";AT j+1,y;"B"; INK 2;AT j+2,y;"P"
1720 LET l=USR z: NEXT j
1725 POKE z+3,80: LET x=x-4
1730 FOR j=x+2 TO x+5
1735 PRINT AT j,y;"(sp)"
1740 LET l=USR z: NEXT j
1750 PRINT  INK 3;AT x+2,y;"O";AT x+7,y; INK 2;"P"
1799 GO TO 141
1805 POKE z+3,120: POKE z+5,2: POKE z+24,28
1810 LET s=s+5: PRINT )0;AT 0,13-LEN STR$ s; PAPER 1;s
1820 FOR j=x+3 TO x+6
1830 PRINT AT j,y-1;"(3*sp)"; INK 6;AT j+1,y-1;"LMN"
1840 LET l=USR z: NEXT j
1850 PRINT AT x+6,y-1; INK 3;"EOO"
1860 FOR j=1 TO 5
1870 PRINT  INK 6;AT x+7,y-1;"IJK": BEEP .01,60
1880 PRINT  INK 6;AT x+7,y-1;"LMN": BEEP .01,50
1890 NEXT j
1900 PRINT AT x+7,y-1; INK 0; PAPER 6; INVERSE 1;"L"; INK 6; PAPER 0; INVERSE 0;"M"; INK 0; PAPER 6; INVERSE 1;"N"
1905 IF ATTR (a,b)=7 THEN  LET s=s+100: PRINT #0;AT 0,13-LEN STR$ s; PAPER 1;s: POKE z+3,0: POKE z+5,7: POKE z+24,29: LET l=USR z: GO SUB 5200: GO TO 100
1910 IF x<>14 THEN  GO TO 1999
1915 PRINT AT 21,y-1; PAPER 6; INK 0; INVERSE 1;"IJK"
1920 LET c=0: FOR j=5 TO 13 STEP 4
1925 IF ATTR (j,y)=7 THEN  LET c=c+1
1927 NEXT j
1930 IF c=3 THEN  LET sd=sd+1: IF sd=4 THEN  LET sn=sn+1: GO TO 7500
1999 GO TO 141
2010 IF ((a+4)<x OR RND>.7) AND ATTR (a+3,b)=4 THEN  GO TO 2400
2020 IF a>=x AND RND>.3 AND ATTR (a+3,b)=2 THEN  GO TO 2600
2030 IF a<x AND ATTR (a+3,b)=6 THEN  GO TO 2800
2050 GO TO 251
2410 POKE z+3,20: POKE z+5,40: POKE z+24,28
2440 FOR j=a TO a+3
2450 PRINT AT j,b;"(sp)"; INK 6;AT j+1,b;"G";AT j+2,b;"D"
2460 LET l=USR z: NEXT j
2515 LET a=j: LET d=(y>b)-(y<=b)
2520 PRINT  INK 3;AT a-2,b;"O";INK 4;AT a-1,b;"H"
2599 GO TO 251
2605 POKE z+3,100: POKE z+5,3: POKE z+24,28
2610 FOR j=a-1 TO a-4 STEP -1
2620 PRINT  INK 6;AT j,b;"F";AT j+1,b;"B"; INK 2;AT j+2,b;"P"
2630 LET l=USR z: NEXT j
2663 LET a=a-4: LET d=(y>b)-(y<=b)
2680 POKE z+3,80
2690 FOR j=a+2 TO a+5
2700 PRINT AT j,b;"(sp)"
2710 LET l=USR z: NEXT j
2720 PRINT  INK 3;AT a+2,b;"O";INK 2;AT a+7,b;"P"
2799 GO TO 251
2810 POKE z+3,120: POKE z+5,2: POKE z+24,28
2820 FOR j=a+3 TO a+6
2830 PRINT  INK 6;AT j,b-1;"(3*sp)";AT j+1,b-1;"LMN"
2850 LET l=USR z: NEXT j
2855 PRINT AT a+3,b-1;"(3*sp)";INK 3;AT a+6,b-1;"EOO"
2860 FOR j=1 TO 5
2870 PRINT AT a+7,b-1; INK 6;"IJK": BEEP .01,50
2880 PRINT AT a+7,b-1; INK 6;"LMN": BEEP .01,60
2890 NEXT j
2900 PRINT AT a+7,b-1; INK 0; PAPER 6; INVERSE 1;"L"; INK 6; PAPER 0; INVERSE 0;"M"; INK 0; PAPER 6; INVERSE 1;"N"
2910 IF a<>14 THEN  GO TO 2950
2915 PRINT  INK 0; PAPER 6; INVERSE 1;AT 21,b-1;"IJK": LET c=0
2920 FOR j=5 TO 13 STEP 4
2930 IF ATTR (j,b)=7 THEN  LET c=c+1
2932 NEXT j
2935 IF c=3 THEN  LET sd=sd+1
2940 IF sd=4 THEN  LET sn=sn+1: GO TO 7500
2960 IF ATTR (x,y)=6 THEN  GO TO 5100
2999 GO TO 251
4010 FOR j=6 TO 13: PRINT  PAPER 2;AT j,8;"(15*sp)": NEXT j
4020 PRINT  PAPER 2;AT 8,11;"GAME OVER";AT 11,10;"PRESS A KEY"
4095 GO SUB 9500: GO TO 7300
5001 LET a=(4*(INT (RND*4)+1))-2
5005 LET b=INT (RND*32)
5010 RETURN
5100 PRINT AT x,y; FLASH 1;"A";AT x+1,y;"B"
```

continued on page 92



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```
5105 POKE z+3,60: POKE z+5,7: PO
KE z+24,28
5110 FOR j=1 TO 6: LET l=USR z:
NEXT j
5120 POKE z+3,0: LET l=USR z
5130 LET li=li-1: PRINT#0;AT 0,
25+li*2; PAPER 1;"(sp)";AT 1,25+
li*2; PAPER 1;"(sp)"
5140 IF li<1 THEN  GO TO 4000
5170 PRINT AT a,b;"(sp)";AT a+1,
b;"(sp)";AT x,y;"(sp)";AT x+1,y;
"(sp)": GO TO 7730
5205 POKE z+3,0: POKE z+24,29
5206 POKE z+5,4: LET l=USR z
5220 PRINT  INK 4;AT 0,0;"ENERGY
JMJMJMJMJMJMJMJMJMJMJMJM"
5299 RETURN
7005 PAPER 0: BORDER 0: INK 7: C
LS : CLEAR USR "a"-100
7010 RESTORE 7040: LET z=USR "a"
-99
7020 LET t=0: FOR i=z TO z+28
7030 READ j: LET t=t+j: POKE i,j
: NEXT i
7050 FOR i=USR "a" TO USR "p"+7
7060 READ j: LET t=t+j: POKE i,j
: NEXT i
7065 IF t<>14455 THEN  PRINT "ER
ROR IN DATA.": STOP
7068 DATA 243,17,16,2,38,1,58,72
,92,31,31,31,14,254,238,16,237,1
21,67,16,254,37,32,244,3
7069 DATA 21,32,232,251,112,154
7070 DATA 159,61,93,117,124,56
7071 DATA 8,62,93,157,21,116
7072 DATA 119,7,14,89,249,188,18
6,174,62,28
7073 DATA 16,124,186,185,168,46,
238,224
7080 DATA 0,207,231,243,251,10,1
0,251
7081 DATA 30,63,79,123,59,158,19
2,124,120,252,242,222,220,121,3,
62
7082 DATA 0,127,62,28,8,0,0,0
7083 DATA 0,0,56,124,15,15,124,5
6,0,0,0,0,255,255,0,0,0,0,28,62,
240,240,62,28
7084 DATA 56,124,15,15,124,56,0,
0,0,0,255,255,0,0,0,0,28,62,240,
240,62,28,0,0
7090 DATA 0,255,255,255,255,0,0,
255
7093 DATA 0,0,8,28,62,127,0,0
7200 LET a$="AC": LET b$="BD": L
ET c$="FG"
7210 LET h=0: LET s=0
7300 LET sn=1
7410 IF s>h THEN  LET h=s
7420 LET s=0: LET li=3
7450 GO SUB 9000
7460 IF INKEY$<>"0" THEN  GO SUB
 9600
7510 CLS : LET sd=0
7511 IF sn>3 THEN  LET sn=1
7515 RESTORE 8000+sn*100
7516 PRINT  INK 2;AT 1,0;"OEOOOO
OEOOOOOEOOOOOEOOOOOEOOOOOE"
7518 FOR j=4 TO 20 STEP 4
7520 PRINT AT j,0; INK 3;"OEOOEO
OEOOEOOEOOEOOEOOEOOEOOEOOE": NEX
T j
7530 FOR j=5 TO 17 STEP 4
7569 FOR l=1 TO 28 STEP 9
7570 PRINT  INK 6;AT j,l+1;"M";
INK 0; PAPER 6; INVERSE 1;AT j,l
;"L";AT j,l+2;"N"
7573 NEXT l: NEXT j
7580 FOR j=9 TO 21 STEP 4: FOR k
=1 TO 2: READ i: PRINT  INK 2;AT
 j,i;"P": READ i: PRINT  INK 4;A
T j-4,i;"H": NEXT k: NEXT j
7600 PRINT #0;AT 0,0; PAPER 1;"(
2*sp)SCORE 00000(21*sp)HIGH(2*sp
)00000(6*sp)LIVES(8*sp)"
7610 PRINT #0;AT 0,13-LEN STR$ s
; PAPER 1;s;AT 1,13-LEN STR$ h;
PAPER 1;h
7620 PRINT #0;AT 0,25;
7630 FOR j=1 TO li: PRINT #0; PA
PER 1;"A(sp)";: NEXT j
7640 PRINT #0;AT 1,25;
7642 FOR j=1 TO li: PRINT #0; PA
PER 1;"E(sp)";: NEXT j
7730 LET d=1: LET x=18: LET y=1
7740 GO SUB 5000
7750 PRINT AT x,y;"C";AT x+1,y;"
D"; INK 6;AT a,b;"F";AT a+1,b;"B
"
7770 GO SUB 5200
7799 GO SUB 9500: GO TO 100
8100 DATA 0,6,17,23,6,14,24,27,5
,17,18,27,6,8,15,24
8200 DATA 5,14,24,18,15,0,27,23,
9,6,26,17,14,0,23,18
8300 DATA 14,5,23,27,9,8,17,26,5
,8,14,23,0,15,18,27
9010 CLS : PRINT  PAPER 2;AT 0,1
0;"Benny  Bunny";AT 2,15;"in";AT
 4,6;" MANIC IJK MECHANIC "
9020 INK 5: PLOT 100,103
9030 RESTORE 9060: FOR j=1 TO 14
: READ k,l: DRAW k,l: NEXT j
9060 DATA 120,-12,0,-56,-40,4,0,
40,-70,7,0,-40,-10,1,0,56
9061 DATA 30,10,120,-12,-30,-10,
30,10,0,-56,-30,-10
9070 FOR j=24 TO 84 STEP 20: PLO
T j,69-j/8: RESTORE 9075: FOR k=
1 TO 10: READ l,m: DRAW l,m: NEX
T k: NEXT j: POKE z+29,201
9075 DATA 6,2,10,-1,-6,-2,-10,1,
0,-16,10,-1,0,16,6,2,0,-16,-6,-2
9080 PLOT 16,35: DRAW 0,55: DRAW
 10,-1: DRAW 0,16: DRAW -20,2: D
RAW 0,-16: DRAW 10,-1
9085 PRINT  INVERSE 1;AT 9,1;"**
";AT 11,15;"Bennys"
9101 PRINT #0;AT 1,0; INK 4;"1=I
NSTRUCTIONS(6*sp)0=START GAME"
9105 INK 7
9110 PRINT AT 18,4;"G";AT 19,4;"
D";AT 14,16;"A";AT 15,16;"B"
9120 GO SUB 9500: RETURN
9500 DATA 29,53,41,65,29,41,53,6
5,31,55,43,67,31,43,55,67,29,53,
41,65
9501 DATA 29,41,53,65,34,58,46,7
0,34,46,58,70
9510 FOR l=0 TO 1: RESTORE 9500
9515 FOR j=1 TO 32: READ k
9520 BEEP .07+l*.07,k-40: BEEP .
07*(1-l),k-28
9530 IF INKEY$<>"" THEN  RETURN
9580 NEXT j: NEXT l: GO TO 9510
9610 CLS : PRINT "AN ANGRY CUSTO
MER IS SEARCHING  FOR BENNY IN H
IS GARAGE."
9620 PRINT ''"IF HE CATCHES BENN
Y OR DROPS A  SPANNER ON HIS HEA
D, BENNY LOSESA LIFE."
9630 PRINT ''"BENNY'S ENERGY RED
UCES ALL THE  TIME, AND IF IT RE
ACHES ZERO, HELOSES A LIFE."
9640 PRINT ''"BENNY CAN RENEW HI
S ENERGY       SUPPLY BY DROPPING
 A SPANNER ON THE CUSTOMER BY RU
NNING OVER IT."
9650 PRINT ''"IF ALL THE SPANNER
S REACH THE   FLOOR, A NEW SCREE
N WILL APPEAR.THERE ARE 3 DIFFER
ENT SCREENS."
9670 PRINT  PAPER 2;" CONTROLS:
"
9680 PRINT '''"LEFT......9"
9685 PRINT ''"RIGHT.....0"
9689 PRINT ''"TO MOVE UP, STAND
STILL OVER A  RED TRIANGLE....";
 INK 2;"P"
9690 PRINT ''"TO MOVE DOWN, STAN
D STILL OVER  A GREEN TRIANGLE..
..": INK 4;"H"
9700 PRINT ''''"Press a key": PA
USE 0: RETURN
```

ALIEN-ZAPPING of a more thought-provoking kind is the theme of **Blaster**, by Phil Willcox of Ely, Cardiff. You must blast a path to the alien buried in a mountain — do you take the shortest route and use less energy or detour for the power pills? The program runs on any Spectrum.

***Blaster** uses our special abbreviations for graphics characters so please read the instructions on the first page of Program Printout before typing in the listing.*

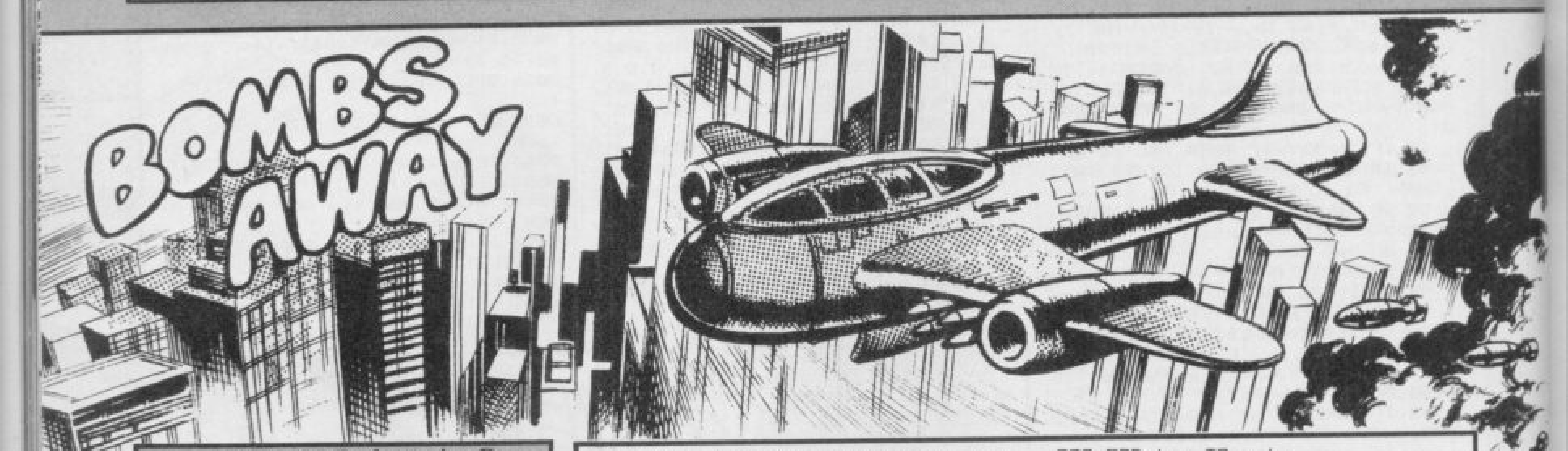
```
   1 REM blaster
   2 REM by Phil Willcox
   3 RANDOMIZE
   5 LET hs=0: LET e=100: LET v=
10: LET w=0: LET s=0: LET sh=1
  10 LET c$="EFG"
  12 LET q$="(32*ig8)"
  13 LET r$="EFGH"
  15  GO SUB 9000
  20 GO SUB 8000
  25 FOR f=0 TO 25: PRINT AT 9,f
;"(sp)": BEEP .1,30-f: NEXT f: P
RINT ; INK 4;AT 8,f-1;"(sp)H";AT
 7,f-1;"K";AT 10,f-1;"J"; INK 7;
AT 9,14;"BLASTER": BEEP .4,-20
  35 PAUSE 50: PRINT  PAPER 4; I
NK 0; FLASH 1;AT 20,8;"INSTRUCTI
ONS (y/n)": BEEP .3,10: BEEP .4,
0
  40 IF INKEY$="" THEN  GO TO 40
  45 IF INKEY$="Y" OR INKEY$="N"
 THEN  GO TO 9600
  50 IF INKEY$="y" THEN  GO SUB
9500
  70 GO SUB 8000
  80 GO SUB 8100
  85 BEEP .05,20
  90 INK 7: PRINT AT 0,0;"SHEET:
";sh;TAB 10;"SC:";s;TAB 20;"ENER
GY:";e;"(sp)"
  95 LET k$="You hit a barrier"
 100 PRINT AT v,w;"C"
 110 IF INKEY$="q" AND v>1 AND A
TTR (v-1,w)=7 THEN  PRINT AT v,w
;"(sp)": LET v=v-1: BEEP .005,0:
 GO TO 100
 120 IF INKEY$="a" AND v<21 AND
ATTR (v+1,w)=7 THEN  PRINT AT v,
w;"(sp)": LET v=v+1: BEEP .005,0
: GO TO 100
 130 IF INKEY$="p" AND w<31 AND
ATTR (v,w+1)=7 THEN  PRINT AT v,
w;"(sp)": LET w=w+1: BEEP .005,0
: GO TO 100
 140 IF INKEY$="o" AND w>0 AND A
TTR (v,w-1)=7 THEN  PRINT AT v,w
;"(sp)": LET w=w-1: BEEP .005,0:
 GO TO 100
 150 IF INKEY$="8" THEN  LET a=1
: GO SUB 200
 160 IF INKEY$="5" THEN  LET a=-
1: GO SUB 200
 170 IF INKEY$="6" THEN  LET a=1
: GO SUB 300
 180 IF INKEY$="7" THEN  LET a=-
1: GO SUB 300
 190 GO TO 90
 205 LET e=e-10: LET x=v: LET y=
w+a: IF e<=0 THEN  LET k$="You r
an out of energy": GO TO 1000
 210 IF ATTR (x,y)<>7 OR y>31 OR
y<0 THEN  GO TO 400
 215 GO SUB 350
 220 IF RND>.25 THEN  LET y=y+a:
GO TO 210
 225 RETURN
 305 LET e=e-10: LET x=v+a: LET
y=w: IF e<0 THEN  LET k$="You ra
n out of energy": GO TO 1000
 310 IF ATTR (x,y)<>7 OR x>21 OR
 x<1 THEN  GO TO 450
 315 GO SUB 350
 320 IF RND>.25 THEN  LET x=x+a:
 GO TO 310
 325 RETURN
 355 PRINT  INK 7; PAPER 0;AT x,
y;"D": BEEP .02,5: PRINT AT x,y;
"(sp)"
 360 RETURN
 401 LET z=0
 405 IF ATTR (x,y)=7 OR y<0 OR y
>31 THEN  RETURN
 410 IF ATTR (x,y)<>4 THEN  GO T
O 500
 415 GO SUB 495
 430 IF z>8 THEN  GO TO 440
 435 LET y=y+a: IF RND>.25 THEN
GO TO 405
 440 IF a=1 AND ATTR (x,y)=4 THE
N  PRINT  INK 4;AT x,y;r$(INT (R
ND*4+1))
 442 IF a=-1 AND ATTR (x,y)=4 TH
EN  PRINT  INK 4;AT x,y;"I"
 445 RETURN
 450 LET z=0
 455 IF ATTR (x,y)=7 OR x<1 OR x
>21 THEN  RETURN
 460 IF ATTR (x,y)<>4 THEN  GO T
O 500
 465 GO SUB 495
 480 IF z>8 THEN  GO TO 486
 485 LET x=x+a: IF RND>.25 THEN
 GO TO 455
 486 IF a=1 AND ATTR (x,y)=4 THE
N  PRINT  INK 4;AT x,y;"J"
 488 IF a=-1 AND ATTR (x,y)=4 TH
EN  PRINT  INK 4;AT x,y;"K"
 490 RETURN
 495 FOR f=1 TO 2: BEEP .01,0: P
RINT AT x,y;"D";AT x,y;"*";AT x,
y;"(sp)": NEXT f: LET z=z+1: RET
URN
 500 LET j=x: LET k=y
 510 IF ATTR (j,k)=33 THEN  GO T
O 550
 520 IF ATTR (j,k)=34 THEN  GO T
O 600
 530 IF ATTR (j,k)=38 THEN  GO T
O 650
 550 PRINT AT j,k; FLASH 1;"*":
FOR f=1 TO 30: BEEP .02,-15: NEX
T f: PRINT AT j,k;"(sp)"
 565 GO TO 1000
 600 FOR f=1 TO 30: PRINT  FLASH
 1;AT j,k;"*": BEEP .01,f: BEEP
.01,f+5: NEXT f
 610 PRINT AT j,k;"(sp)": LET e=
e+INT (8+32*RND): RETURN
 650 PRINT  FLASH 1;AT x,y;"*":
FOR f=1 TO 5: FOR g=1 TO 50 STEP
 5: BEEP .01,g: NEXT g: NEXT f
 660 LET s=s+e*(sh): LET e=100+s
h: LET sh=sh+1: LET v=10: LET w=
0: GO TO 70
1000 CLS : PRINT  FLASH 1;AT 6,1
0;"GAME OVER"
1005 IF s>hs THEN  LET hs=s
1010 FOR f=40 TO 1 STEP -2: BEEP
 .02,f: NEXT f
1015 PRINT  FLASH 0;AT 11,0;k$;A
T 13,0;"You scored ";s;" points"
: PRINT : PRINT "The high score
stands at ";hs: PRINT : PRINT "P
ress a key to play again"
1025 IF INKEY$="" THEN  GO TO 10
25
1030 LET v=10: LET w=0: LET s=0:
 LET e=100:: LET sh=1: GO TO 70
8000 BORDER 0: INK 7: PAPER 0: C
LS
8001 LET t=INT (RND*4+2)
8002 LET f=1
8005 LET g=INT (RND*3+1)
8025 PRINT  INK 4;AT f,t;c$(g);q
$( TO 31-t)
8026 BEEP .02,40-f: BEEP .03,45-
f
8027 LET f=f+1: IF f>21 THEN  RE
TURN
8040 IF g=1 AND t>3 AND RND>.5 T
HEN  LET t=t-1
8045 IF g=2 AND t<6 AND RND>.5 T
HEN  LET t=t+1
8050 IF g=3 AND t>3 AND RND>.6 T
HEN  LET t=t-1
8055 IF g=3 AND t<6 AND RND<.4 T
HEN  LET t=t+1
```

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```
8060 GO TO 8005
8100 LET c=0
8110 LET x=INT (RND*20+2): LET y
=INT (RND*15+15)
8120 IF ATTR (x,y)<>4 THEN  GO T
O 8110
8130 PRINT  INK 2; PAPER 4;AT x,
y;"A"
8135 BEEP .02,c: BEEP .03,c+5
8140 LET c=c+1: IF c>5 THEN  GO
TO 8200
8150 GO TO 8110
8200 LET c=0
8210 LET x=INT (RND*18): LET y=I
NT (RND*21+7)
8220 IF ATTR (x,y)<>4 OR ATTR (x
+1,y)<>4 OR ATTR (x+2,y)<>4 OR A
TTR (x+3,y)<>4 OR ATTR (x+4,y)<>
4 OR ATTR (x+5,y)<>4 THEN  GO TO
 8210
8230 LET g=INT (RND*6)
8240 FOR h=1 TO g
8250 PRINT  INK 1; PAPER 4;AT x+
h-1,y;"L": BEEP .01,x+g
8260 NEXT h
8270 LET c=c+1: IF c>sh*2+7 THEN
  GO TO 8300
8280 GO TO 8210
8300 PRINT  INK 6; PAPER 4;AT IN
T (RND*20+1),30;"B"
8305 BEEP .04,30
8330 RETURN
8999 STOP
9000 FOR f=144 TO 155: FOR n=0 T
O 7: READ z: POKE USR CHR$ f+n,z
: NEXT n: NEXT f
9010 DATA 60,126,255,255,255,255
,126,60
9030 DATA 195,129,255,60,126,126
,60,231
9050 DATA 24,24,60,255,255,60,24
,24
9070 DATA 0,0,0,24,24,0,0,0
9090 DATA 3,7,15,63,63,31,31,127
9110 DATA 127,63,63,31,31,7,3,3
9130 DATA 63,31,31,63,63,127,63,
31
9150 DATA 127,63,3,1,1,3,15,63
9170 DATA 252,248,208,128,128,19
2,236,254
9190 DATA 0,129,131,193,193,131,
231,255
9210 DATA 255,155,131,193,193,13
1,131,1
9230 DATA 28,14,7,14,28,56,112,5
6
9240 RETURN
9500  PAPER 4: BORDER 4: INK 0:
CLS : PRINT AT 0,8;"INSTRUCTIONS
"''"  Blast your way through the
    mountain to zap the buried
            alien:"; INK 6;"B"; I
NK 0
9501 PRINT : PRINT "  Your ship
"; INK 7;"C"; INK 0;" moves and
fires inthe four orthogonal dire
ctions"'"    [Q]  moves up
             [A]  moves down
             [O]  moves left
             [P]  moves right"
9502 PRINT "  To fire, use the c
ursor keys  (5 to 8)"
9503 PRINT : PRINT "  Each time
you fire your energyis diminishe
d by 10 points.     Zapping the
power pills "; INK 2;"A"; INK 0;
"       increases your energy by
 a       random amount"
9504 PRINT : PRINT "   Press a k
ey.": PAUSE 0
9505 IF INKEY$="(sp)" THEN  GO T
O 9505
9506 CLS : PRINT "The game ends
if you run out of energy or hit
one of the alien'sbarriers: L"
9507 PRINT : PRINT "If you manag
e to shoot the alienyou will mov
e on to a new sheet The score is
 the sheet  number  multiplied b
y the remaining     energy."
9508 PRINT : PRINT "Unfortunatel
y for you your laseris unpredict
able, so the amount of mountain
blasted away by eachshot can var
y; so be careful!"
9509 PRINT : PRINT : PRINT "Pres
s I for instructions or     P to
 play"
9510 PAUSE 0
9520 IF INKEY$="i" THEN  GO TO 9
500
9530 IF INKEY$="p" THEN  RETURN
9540 GO TO 9520
9600 CLS : BEEP .02,25: PRINT :
PRINT : PRINT : PRINT "Your comp
uter is in": PRINT : PRINT "
  CAPS LOCK mode": PRINT : PRINT
 "Please adjust your machine
  (CAPS SHIFT & 2) and  RUN."
9999 STOP
```



THAT OLD favourite Bomber returns to our pages in a version for the QL by R Hartill of Rhydyfelin, Glamorgan. Blast away at the skyscrapers, or fire missiles at them if you get too low, to clear a flat space to land.

The game uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout before entering the listing.

```
100 PAPER 0:INK 7:CLS:POKE_W 163
982,256:score=0:MODE 4
110 PRINT"Press for level of dif
ficulty,1 to 5(5 is easier)":REP
eat v
120 k=CODE(INKEY$)-48:SELect ON
k:=1TO 5:l=k:EXIT v:END SELect :
END REPeat v
130 CLS#0:pow=10:init:STRIP 0:FO
R r=19 TO 1 STEP -1
140 FOR n=0 TO 36
150 pow=pow+1.5:AT 0,0:PRINT,"Sc
ore =  ";score:INK#0,7
160 CSIZE#0,3,1:AT#0,1,0:PRINT#0
;"GUNS (CTRL+])";:INK#0,3:AT#0,1
,8
170 IF pow<0:PRINT#0\;"Reloading
";:BEEP 0,9022,2620,145,1253,260
3,4212,5286
180 INK#0,4:IF pow>0:PRINT#0 \;"
Loaded   ";:BEEP
190 AT 20-r,n:PRINT" (CTRL+SHIFT
+Y)":IF pow<0:a$=INKEY$:ELSE IF
pow>=0:keys
200 IF s(n+1,r):crash:ELSE NEXT
n:NEXT r
210 IF l=1:RUN 40:ELSE l=l-1:RUN
 40
220 DEFine PROCedure crash:BEEP
30000,3,255,2,3,4,9,11:CLS#0
230 PRINT#0;"You scored :";score
!"points":PAUSE 400:RUN:END DEFi
ne
240 DEFine PROCedure init:DIM s(
38,20):MODE 8:CLS::FOR c=1 TO 36
250 max=19-l:h=RND((5-l) TO max)
:h=h-1:p=h:IF h<0:h=0
260 REPeat f:STRIP (RND*5)+1:s(c
,h)=1:h=h-1:IF h<1:EXIT f:ELSE E
ND REPeat f
270 FOR b=1TO p:IF s(c,b):y=(20-
b):AT y,c:PRINT":"
280 NEXT b:NEXT c:END DEFine
290 DEFine PROCedure keys:k=CODE
(INKEY$):IF k=232:bomb:END DEFin
e
300 IF k=27:st:pow=pow-15:END DE
Fine :ELSE END DEFine
310 DEFine PROCedure bomb:pow=po
w-15
320 x=20-r:y=n:x_to=x+6+1:IF x_t
o>19:x_to=19
330 FOR t=x TO x_to
340 n=n+1:pow=pow+.2:IF n>36:r=r
-1:n=0:IF r=0:RETurn
350 AT t,y:PRINT".":IF s(n,r):cr
ash
360 AT 20-r,n:PRINT" (CTRL+SHIFT
+Y)":FOR m=1 TO 40:NEXT m
370 AT 0,0:IF s(y,20-t):BEEP 100
0,3,255,2,3,4,9,11:score=score+1
0
380 PRINT,"Score =  ";score:s(y,
20-t)=0:AT t,y:PRINT"(sp)":NEXT
t:END DEFine
390 DEFine PROCedure st:x=20-r:y
=n+3:y_to=y+8:IF y>35:y=1:y_to=y
+7+1:x=x+1
400 x1=x:FOR t=y TO y_to
410 n=n+.5:pow=pow+.2:IF n>36:r=
r-1:n=0:IF r=0:RETurn
420 IF s(n,r):crash:ELSE :AT 20-
r,n:PRINT" (CTRL+SHIFT+Y)":FOR m
=1 TO 7
430 BEEP 30000,1,14,11,4,12,3,6:
t1=t
440 IF t>36:x1=x+1:t1=t1-35:IF x
1=20:RETurn
450 AT x1,t1-1:PRINT"-":IF s(t1,
20-x1)THEN
460 BEEP 1000,3,255,2,3,4,9,11:s
core=score+5:
470 AT 0,0:PRINT,"Score =  ";sco
re:s(t1,20-x1)=0
480 END IF :AT x1,t1-1:PRINT"(2*
sp)":NEXT t:AT x1,t1-1:PRINT"(sp
)":END DEFine
```

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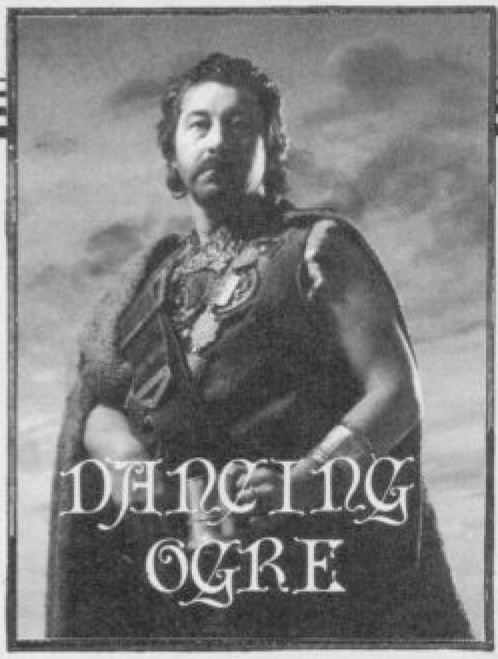
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I have been concerned over the damage done to my protuberance by the confounded fire-demon.

So much so, in fact, that I decided to take professional advice from the Priestesses of Wisdom and Sudden Health. There are a number of their priories scattered about these parts and one lay on a side road beyond the end of the swamps.

We bade farewell to our escort and entered a greener, hilly country with many resinous pine groves. The priory was surrounded by one of those and near a lake. The Holy Sisters gave us a good welcome but immediately removed our provisions. We began to feel apprehensive but I insisted to Iubba and the twins that we continue.

First came the Strenuous Worship Racks and heavy weights were used to stretch our muscles — there were few to stretch. After iron ingots had been hung from our limbs for some hours we were despatched to the Calm Relaxation and Contemplation Cells.

Here, Orcish foot masseurs ministered to us. Do not take that to imply that they massage your feet. Far from it — they walk up and down your frame with their calloused soles, occasionally cracking a joint for good measure. During this they sing . . . a cheerful Orcish song in a traditional, atonal mode, very like a spitted seagull.

By that time we were beginning to feel Healthily Holy — the first of many states of painful bliss advocated by the Sisters — and so were locked in the searing insides of the steam baths along with some 40 other pilgrims. Thus, said the Sisters, we would purge our sins and cleanse our bodies for fresh triumphs against evil. Zul and Zel liked that not, having spent many months developing their distinctive smell.

While we sweltered in the awful heat we talked. Paul the Taylor and Twang the Archer of Acklam were both bewildered by the mystery of the Stitched Swamp on **Espionage Island** — an old but constantly recurring problem. Well, this is a sort of play on words, for stitched means the same as sewn. Sewn has all the compass points to follow. Do so and be safe.

Grak Howard of Wigston Magna had had ill luck guiding **Sherlock** to Leatherhead. Cylar the Shadow, steaming healthily, told him that he should call a cab, climb in and say to the cabby "Go to King's Cross Road." On arrival he should climb out of the cab, head north-east four times and wait for the train to appear. To board, just climb in. That may do the trick.

A northern barbarian, Healey Odinsson of Oslo, told us that he was continually arrested in his search for **Hampstead.** Whenever he attempted to change from his tracksuit into more respectable clothing lawmen would appear to charge him with indecent exposure. If, as I suspect, he wishes to don his tweeds, the best and only place to do so is the second-hand clothes shop itself.

Healey and Ablott the Abbot of Alkborough found they had common problems in their quest for the **Dragontorc.** As they sipped their drinks of soured sheep's milk they asked me how to find the letters X, I and T which enable escape from the Vaults of Locris.

Gordo sweats it out with other pilgrims at the Priory of Health

The Archmage Hewson himself has instructed me in the matter. Listen well then. One letter may be found in a pile of old rubbish near the entry to the Vaults. A second is concealed where a skeleton lies at the back of a room. The last is more difficult — to discover it you must open all three chests scattered around the place. Take the key from the final chest to a room with a stool and fireball. Use your servant to touch the stool. It should then shapechange into yet another chest. Unlock it to find the last letter and sundry other treasures.

Graham the Scott of Sirius, Mill Loch, Lochmaben DG11 1QA offered me useful maps of the Lands of Midnight — for which my thanks are due. He will offer guidance to travellers in Ket, Middle Earth and many of Level 9's spells if you write to him courier prepaid. In return he asked me how to enter Castle Oops in **The Quest.** He told me, too, that he had an unreadable scroll. That is a false document — seek the real item elsewhere. To enter the castle it is wisest simply to utter the spell "Open South".

Philip the Alchemist of Noctorum and some other weary warriors had discovered a Golden Key in their travels with **The Hobbit.** None could find any use for it. Gilbo the Great told me long ago that there was no use to the thing. It is mere treasure, slightly pink and fishy.

Korah Swiftaim, Sorceress Extraordinaire, proferred advice on the search for the **Red Moon** of Baskalos. "I will pass on a few tips," says she "that those who follow in my footsteps may find the going easier. Once you have the horseshoe you may obtain iron coins from beneath the grating — for the shoe is in reality a horseshoe magnet.

"Always wear a cloak to pass the cloaked statute and wear a mask if swimming underwater. If a watchdog blocks your path put pills into its meat and feed the brute. Oh, and there is a spell which destroys mummies — say Obis and then Ollabin! Lastly to cross the chasm, drop the scroll and the acorn and then read the scroll."

She asks if there be a way to pass by the Blacksmith Giant without killing him or being killed — being a pacifist she would prefer to keep the peace but her other reason is that his ghost keeps reappearing with evil intent and blows.

Michael the Slightly Green of 13, Laxford Road, Caterham, Surrey boasts of completing **The Hulk.** He offers assistance to all who write prepaid. As a taster he suggest that when faced with empty holes the curious should delve deeper. Kill no ants but dispose of your vulnerable areas.

So, at last the Sisters released us into the blessed cool. My body ached with so much good health and holy pain that I completely forgot my belly and its burn — so, indeed, their treatment works. All of us lay very quiet and very still that night, though the twins sought out a stable to re-establish their aroma.

Farewell, in terrible pain, until next moon, my friends.

Greatbelly

Gordo Greatbelly, Landlord

If your have a tale to tell, or are in need of a helping hand, write to the Landlord of the Dancing Ogre c/o Sinclair User, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.

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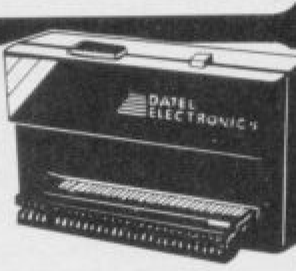
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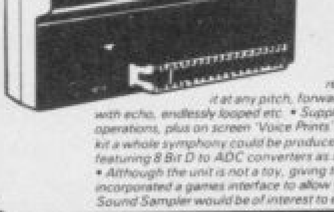


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Richard Price takes on an icy foe . . .

In the deep midwinter

THE SOFTWARE business seems to suffer as much from the silly season as your average daily newspaper. Everyone goes off to Ibiza, Crete or Terrormolinos for the whole of August, while the companies all tuck their software aces up their sleeves ready for the Christmas onslaught on your teetering bank balance.

Then, in late summer, when everyone has returned invigorated from their steamy holiday haunts, comes the time of the Great Gathering. Tribes of PR persons, hardware salesmen, ashen-faced advertising reps and regiments of over-tired journalists throng excitedly into the bars at Olympia for the mighty PCW Show. Such scenes may well convince you that there *is* such a thing as a free lunch.

This is the place, you might think, where new adventures will surface in all their glory to compete with the skimpily clad go-go dancers in their effect on your pulse-rate. Not so. This year's show produced a dearth of adventure material and the vagaries of magazine print means that this famine works its way through to the reader round about now.

PREVIEW

The Snow Queen

As I wandered the lanes of the vast exhibition hall, I ran into the Games Mistresses, alias the girls of St Brides, whose first production, **The Secret of St Brides**, I reviewed last month. They favoured me with a pre-production preview copy of their latest opus **The Snow Queen.**

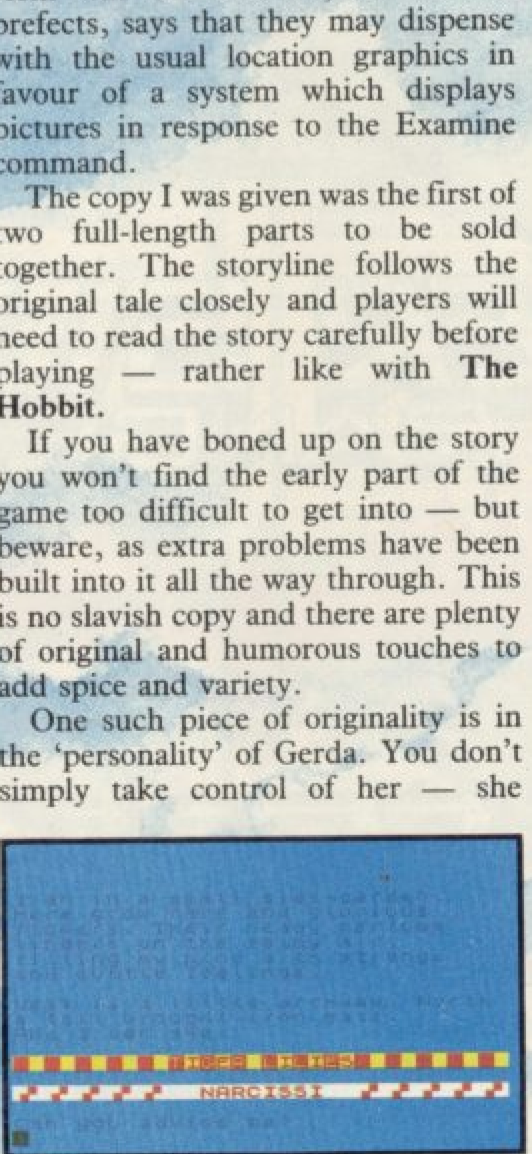
This is a computer reworking of the much-loved fairy-tale classic by Hans Andersen and has a plot ideally suited to the adventure format — the young heroine Gerda journeys into magic and danger in search of her friend Kay, who has been spirited away by the agents of the maleficent and beautiful Snow Queen.

The game is a Quilled text adventure. There are to be graphics included in the final version but the Girls are not yet sure what their final form will be. Priscilla, one of the prefects, says that they may dispense with the usual location graphics in favour of a system which displays pictures in response to the Examine command.

The copy I was given was the first of two full-length parts to be sold together. The storyline follows the original tale closely and players will need to read the story carefully before playing — rather like with **The Hobbit.**

If you have boned up on the story you won't find the early part of the game too difficult to get into — but beware, as extra problems have been built into it all the way through. This is no slavish copy and there are plenty of original and humorous touches to add spice and variety.

One such piece of originality is in the 'personality' of Gerda. You don't simply take control of her — she allows you to help her. There are times when she won't approve at all of what you suggest and, if things go wrong, she will simply head off on her own and end up in a right pickle.



When I sent her down on a bucket into a well poor Gerda got soaked. She immediately went into a real sulk and ran off into the trees of the witch's cherry orchard. There she got stuck and had to be helped to safety from the slavering jaws of a rabid guard-dog.

You will also need to remember that Gerda is quite a little girl and not necessarily as accomplished in her education as you are. In her search for escape from the bewitchment of the orchard she comes across some books which teach the language of flowers and birds. She tries hard to understand them but you will have to push her more than once to concentrate properly.

All this gives a nice feeling of interplay between Gerda and yourself. The gradual increase in the difficulty of the problems also helps to get your enthusiasm going because, by the time you get well and truly stuck — instead of temporarily stumped — you will have progressed far enough to want desperately to continue.

The Snow Queen is well-written and it really is a pleasure to see literate computer games passing on the pleasures of traditional stories. I'm sure that it will have considerable appeal to everyone in the family, girls and boys, big and little. The final version should make an ideal Christmas gift — we'll give the game a rating as soon as the retail version is available.

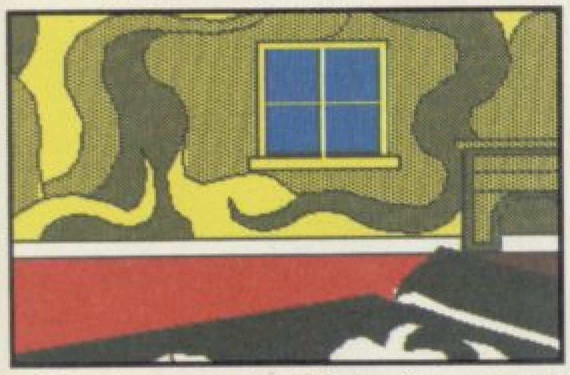


Madcap Manor

Gilsoft, publishers of **The Quill** and **Illustrator**, also produces its own-brand games. **Madcap Manor** is one of the new adventures which offer a graphic game on one side and an expanded text version on the other.

It's 1933 and you are cast as the famous Belgian detective. Inspector Le-Gles — oww! As befits such a personage you've been invited as a house-party guest to Madcap Manor, the stately residence of Lord Algernon Stingy — and boy, is he mean. It even costs money to play billiards at his posh gaff.

The action begins, naturally enough, with Monsieur Le-Gles stroll-



ing down to breakfast after a good night's kip on a feather bed. He meets his distraught host who tells him that the Dowager Lady Ditchley's giant ruby ring has been stolen during the night. Gallantly Monsieur l'Inspecteur accepts the challenge.

Thus you begin your exploration of the Stingy mansion in true Agatha Christie style. The place is vast and contains servants' quarters, cellars and secret passages as well as the main apartments and spacious grounds. One secret route will only be found if you can assemble all the necessary equipment — and aforementioned finance — to play a very poor game of billiards. As the interpreter says 'a proper little Hurricane Higgins, aren't we?' Make sure you go for the big score and pot black!

It soon becomes apparent that there is more going on at the Manor than meets the eye. The long-lost Amazonian explorer, Horatio Stingy, has a finger in this pie, as you'll discover if you ring for a servant from the summer house. A Jivaro Indian will appear to give you advice. Other servants and guests can be summoned or encountered and there's a living *Cluedo* feel to the play.

The game is Quilled, of course. The graphics, done with **The Illustrator**, are pretty good and the cellar pictures quite moody and atmospheric, as are some of the splendid bedrooms and drawing rooms. Once you've had a look at those you may want to try out the plain text game. That has more detailed description and is slightly fuller, with added locations.

The house and its grounds are fairly open to exploration — obviously excepting the secret parts which you'll have to discover by trial and error. Be careful not to miss opportunities — I dithered when a wall slid open and it shut before I got a chance to get through. Saving regularly helps in those situations.

There's a vein of silly humour running through the action and the interpreter's responses are lively and occasionally cheeky. That encourages you to persist and make progress in a friendly and cheerful way.

Madcap Manor, then, is an entertaining and well-constructed variation on the detective theme. I like the idea of having two versions of the game as you end up having your cake and eating it too, if you feel like it. Nice one, Hercule.

The Patch

Gilsoft continues to add to the versatility of **The Quill** adventure writing system. **The Illustrator** brought graphics within everyone's reach but not everyone wants the full-screen separate location graphics it produces. Split-screen pictures are more the norm these days and **The Patch** will allow you to put graphics and text together. It will also do a few other things besides.

As usual, there are thorough instructions provided with the cassette, though it is assumed that by now you will be familiar with the workings of **The Quill** and **The Illustrator.** Gilsoft recommends that **The Patch** should be used with a C series **Quill**, though this is not essential. Do remember that

continued on page 102

continued from page 101

you can get an upgrade of your earlier versions by sending off your cassette insert along with £2.99.

The main function of **The Patch** is to change the operation of the database and graphics programs to allow split-screen graphics and text. It does that by amending the code and allowing you to specify, using Flag 27, where your text lines should begin beneath the location graphic. With that system your picture will slowly scroll up the screen as you input text.

The other routines can be accessed by using Flag 28. There are a number of sound effects such as siren, telephone, electric shock and white noise. You will also be able to use different typefaces in the same game — instructions are provided on how to Poke them in and out of use. Different types of key-click noise are available as well as routines to turn pictures on or off.

To use **The Patch** you will first have to create your text and graphic databases in the normal way on **Quill** and **Illustrator** but incorporating the new instructions detailed in **The Patch** documentation. Those instructions won't have any effect on the usual operation of those utilities but, once you've loaded all the data, you'll find that you have your split-screens, sound effects or whatever in action in a complete adventure.

Gilsoft certainly isn't resting on its laurels and seems to be set on continually improving the adventure writing system — it's probably fair to wonder just where adventure would be without that stimulus. Hang on in there for the long-awaited text compressor!

London Adventure

From the pleasures of rural life we return to the pressures of the big city with the **London Adventure** from Fridaysoft. Once again we have a Quilled game in text only. I could only find one very obscure reference to a 'quill pen' in the game and assume that to be the credit — perhaps it could have been a bit more prominent?

This game is very much like a computerised *A to Z* guide to London. There are over 100 locations, many of them well-known London features like Big Ben, Cleopatra's Needle, Madame Tussaud's and so on. The aim is to explore London, which is mapped more or less correctly, to discover the numbers which make up the combination of a safe deposit box. Opening the box will deliver your rightful inheritance. The correct sequence for the numbers will only be given when you've found all eight.

Regrettably, the authors have imposed a limitation which can end the game if you run over a certain level. That is very counter-productive as it stops the kind of leisurely exploration which is a normal pleasure of the genre. Let's keep all that scurrying around for the arcade, eh folks?

In general the description and detail is quite full with a good grasp of



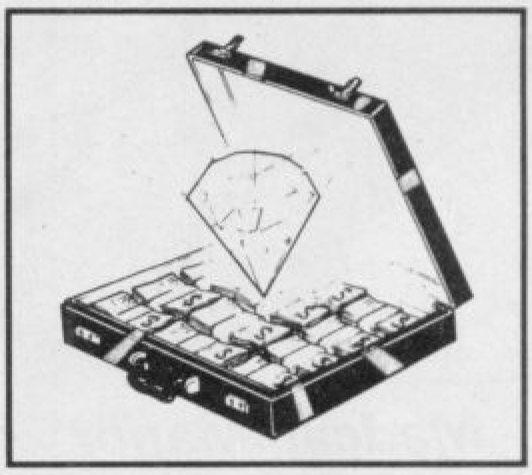
London's geography. You can visit most of the major tourist attractions in your quest and there's enough event to keep up your interest. Some of the problems are more at the level of verbal gymnastics, however, and I do feel it's pretty unnecessary to make life difficult for players by not providing adequate synonyms for actions. Using 'through' as a verb instead of 'enter' when you've already allowed it at other points isn't really a puzzle — it simply becomes aggravating and that tends to mean most people will stop playing.

That, along with the turn limitation, reduces the general playability of a game which would not be that bad provided you were really into the idea of exploring London. Not enough for me, and the price is a bit steep for what you get.

The Pay-Off

Lastly there's **The Pay-Off** from Bignose Software, another company encountered at the PCW show. This is a very plain text adventure, apparently licensed from the Atari Corporation — I suspect at some time in the more remote past.

There's this hood Luigi, see, and you're into him for 40 grand in gambling debts. There's also a large and fancy gemstone deposited in a vault



somewhere in the Big Apple — or New Jersey if that's any different. The rock is worth 40 grand too, so all you gotta do to stay cool is to find it and fence it. OK?

The location descriptions are slim, if not emaciated, and are more like names with a list of objects present. That might not necessarily be a big disadvantage if the screen display and response times weren't so slow. As it is, the presentation and speed are reminiscent of ZX-81 and very early Spectrum games. At the asking price of £5.95 that is simply not good enough — especially when you recall that you can pick up fast and complex bargain games for less than that.

The Snow Queen
Publisher St Bride's, Burtonport, Co Donegal, Eire.
Memory 48K

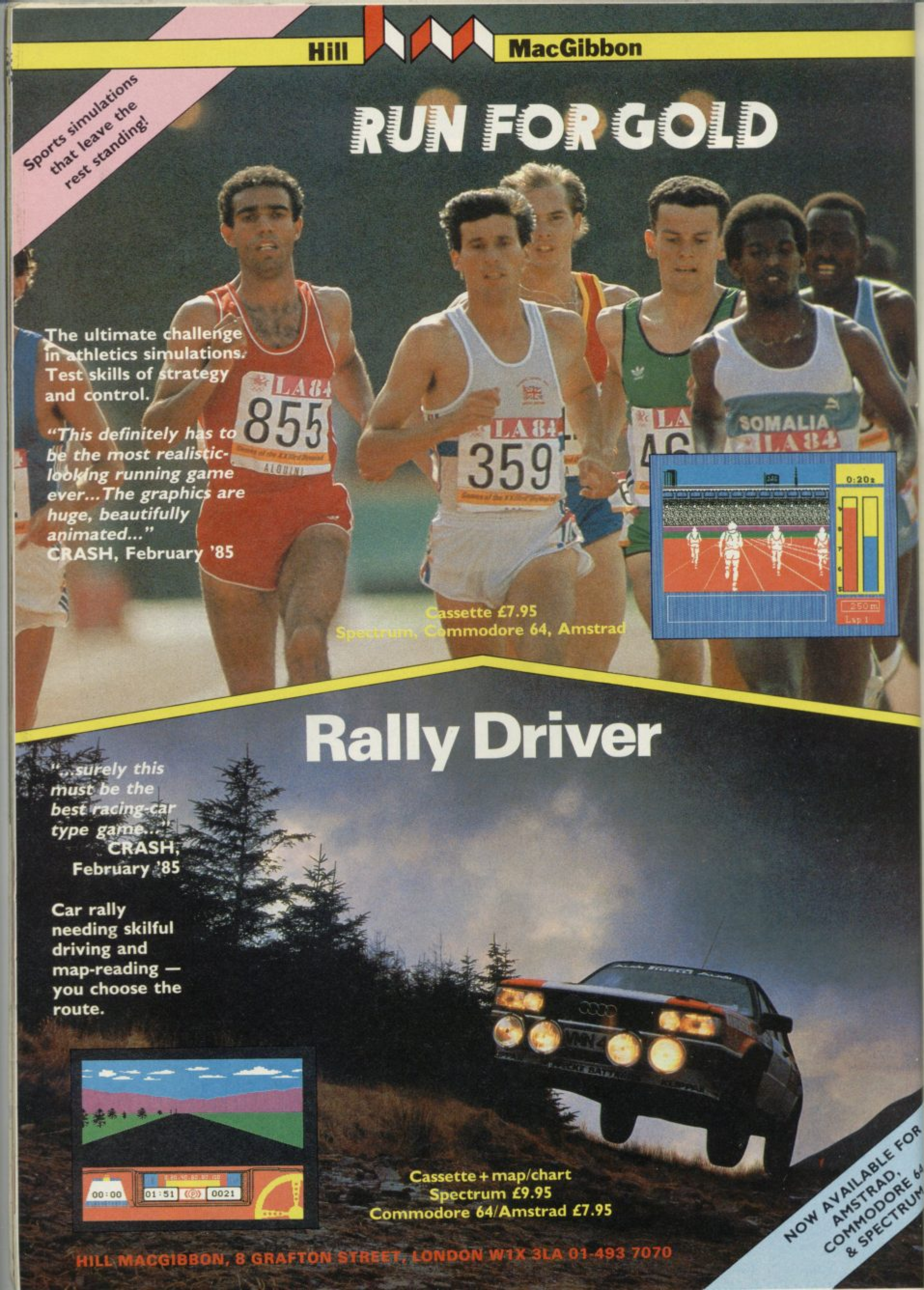
Madcap Manor
Publisher Gilsoft
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★★★★

The Patch
Publisher Gilsoft
Price £5.99 **Memory** 48K
★★★★★

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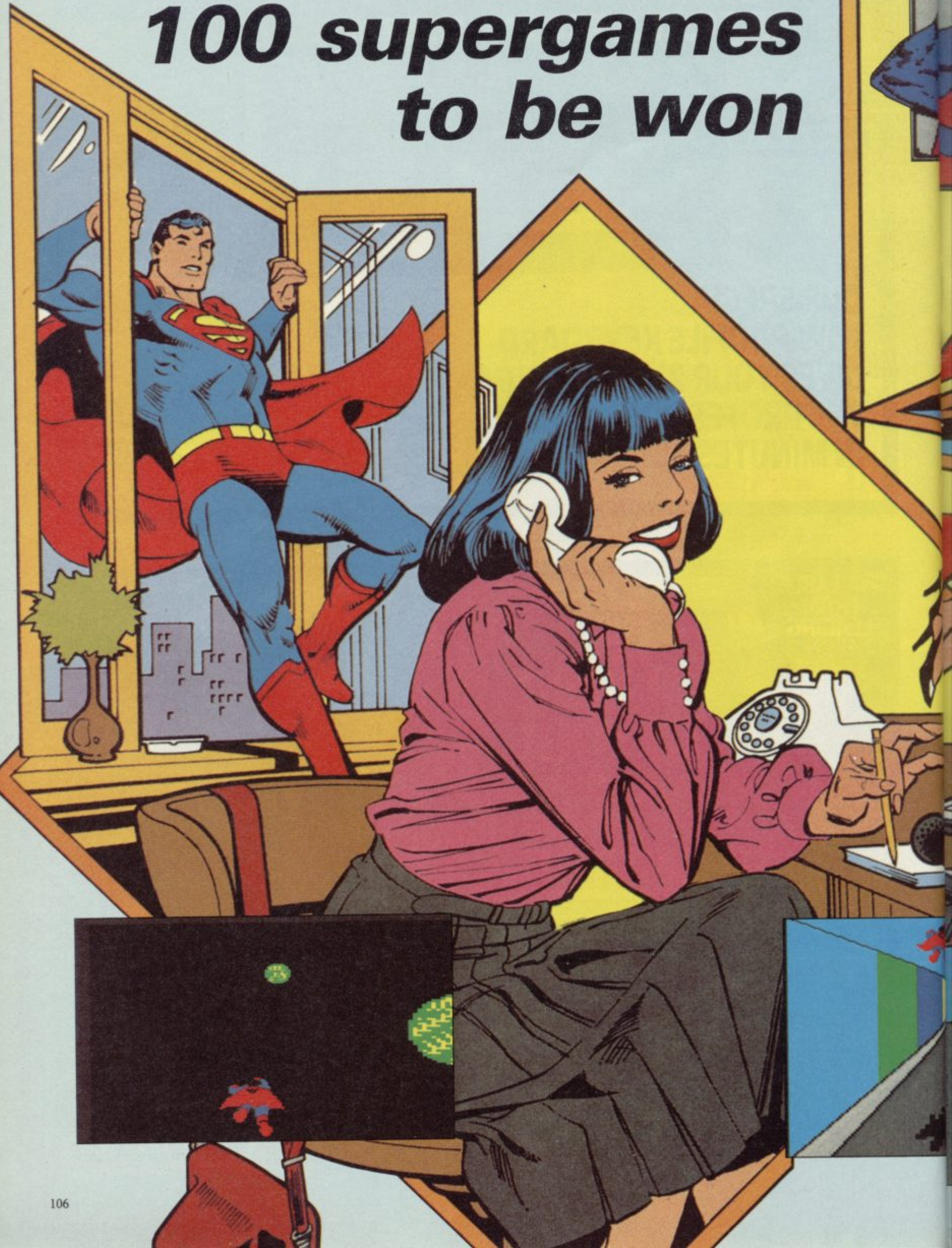
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Beyond has been working on the Spectrum conversion of the original First Star game, which is being launched simultaneously in Britain, Japan and the States, covering a range of machines including the Spectrum, Commodore 64 and Amstrad. The screen pictures on this page are from the Commodore version.

The game, for one or two players, pits Superman against the super-villain, Darkseid, whose aim is to dominate all sentient life forms. Only one thing stands in the way of Darkseid's ambition – the Anti-life formula, which is genetically encoded in a few inhabitants of the planet Earth.

While Darkseid attempts to lure carriers of the formula into his lair, Superman uses his superpowers of flight, strength and heat vision to thwart the evil plan. The game is played out in the skies above Metropolis, the city's streets and the sewers below. As each player achieves a certain degree of success, the action switches to an arcade intermission, in which Superman must smash through a meteor storm avoiding chunks of kryptonite, fly between skyscrapers or negotiate an underground tunnel.

Superman will be out in the shops in early November, priced £9.95. But if you can't wait, try exercising your superpowers on our simple quiz. Send the answers on a postcard to: Superman Competition, *Sinclair User*, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU, to arrive no later than Friday, November 15. The first 100 entries selected after that date will be the lucky winners. No employees of EMAP or their friends are allowed to enter. Only one entry per reader is allowed.



It's easy this month. All you have to do is answer the following questions, based on the Superman comics. We've tried to deliberately mislead you by including some irrelevant multiple choice answers, but no doubt your powers of perception will see through that, and you'll be able to detect the correct answers. So if you think, stupidly, that the answer to question one is (a), then write 1(a) on your postcard, and so on. Now, it's over to you:

1. **Where did Superman spend his childhood: (a) Swindon; (b) Smalltown; (c) Smallville?**
2. **Which variety of kryptonite causes Superman to permanently lose his superpowers: (a) green; (b) red; (c) gold?**
3. **What is the name of Superman's Arctic hideaway: (a) Fortess of Solitude; (b) Fortress of Isolation; (c) Fortress of Silence?**
4. **Who did not work with Clark Kent at the *Daily Planet* offices: (a) Jimmy; (b) Lana; (c) Perry?**
5. **Who would be regarded as one of Superman's greatest foes: (a) Bizarro; (b) The Penguin; (c) Brainiac?**

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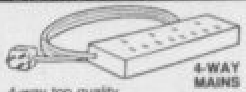
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The Gargoyle speaks


A friend drops in on Roy and Greg

Chris Bourne braves the Gargoyle's lair and penetrates the misty world of Cuchullain and Celtic folklore

WHEN GREG FOLLIS was born, in the mists of time, before the dawn of legend, when prehistoric valve computers stalked the earth and roared defiance at the lowering skies, comets blazed and earthquakes shook the rolling meads of Smethwick. And wise warlocks knew, beyond a shadow of a doubt, that the Gargoyle had arisen in the land.

"I was born too," avers Royston Carter, knight-programmer and keeper of the bytes.

"You were hatched," says Greg. "I remember the shell on your head."

This wise-cracking pair of programmers are among the geriatrics of software, which is to say, they're both well over 30. "We started in commercial programming about 17 years ago, by which you can deduce that none of us is young" says Greg.

And so they sweated and they swore and they learned their craft over years of writing utility packages and CP/M monitors and even a language, DPL1, used in on-line development systems.

"We're both entranced by computers," says Greg. "For me it was when our engineer, Keith Potter, walked in and kicked our 8K ICL 1901, and it started working. I knew then it was for me."

And they're still entranced, though they've given up the world of AI research, expert systems and the rest to write adventure games which knock for six most conventional examples of the breed.

"We were writing software for someone else and they were marketing it poorly," says Greg, mincing no words. "We wrote an integrated database for a micro system. It was sold to the Steel Stockholders Association. God knows why.

"We were salaried and that's all. There was no potential for any vast increase."

Remember, these guys had visions of wealth. Royston smiles as the memories surge. "You were quite interested in sordid sex," admonishes Greg, "and couldn't afford any. And I couldn't provide it."

At the time, a million lasers were lighting up the evenings of Spectrum owners all over Britain. It was 1983, year of the shoot-'em-up, and games like **Time-Gate, Arcadia, Zzoom,**

Invasion of the Body Snatchers and many, many others were all the rage. Greg and Roy, not unnaturally, decided to do their own, still working for the taskmasters at their research software.

So they wrote **Ad Astra.** It had very big graphics, which have become something of a trademark with Gargoyle. It was a straight invaders-style zap game, with asteroids hurtling at you, and waves of aliens. It was very good, as far as it went, with bits of humour such as the Starship *Enterprise* making a fleeting appearance. It still sells a few hundred copies every so often, according to Gargoyle.

"We had a very arrogant look at the games market." Greg explains. Of course, by the time it was released, nine months after conception, everybody was into **Jet Set Willy** clones in multi-screen jump 'n' dodge games. Greg and Roy gave up trying to outguess the market and did their own thing instead.

They took a trip to the world of Celtic mythology and produced two of the best games ever seen on the Spectrum — **Tir na Nog** and **Dun Darach.**

It all started with the 'walking man,' a 14-part animation written by Greg, which produced a cartoon of a man walking across the screen. That formed the basis for **Tir na Nog.** To explain where Cuchullain comes from we have to go back to Greg and Roy's distant youth.

"Roy and I first got together on SF and fantasy. I gave Roy a list of books to read, and we used to take afternoons off to go down to London to Dark They Were and Golden-eyed, a bookshop on Tottenham Court Road. It's not there any more."

They were also fairly fanatical if not downright obsessive about Tolkien. They don't speak elvish, but you can bet they've read all the runes.

". . . and Thomas Covenant and Black Cauldron and the Katherine Kurtz books . . ." continues Greg. "I also used to play *Dungeons and Dragons* and *Tunnels and Trolls*. And real-life mythology of course and — all right, I confess! — I still read *Imagine* magazine."

It was obvious from the start that some sort of fantasy setting would be ideal for the walking man. "One we thought of first was Gilgamesh." That is Greg showing his high literary taste. The *Epic of Gilgamesh* is the first known piece of written fiction, recorded on Sumerian tablets. It's thousands of years old.

"Unfortunately Gilgamesh is a little remote, and if you take the seamy bits out there's not much left. We cast around for something more interesting."

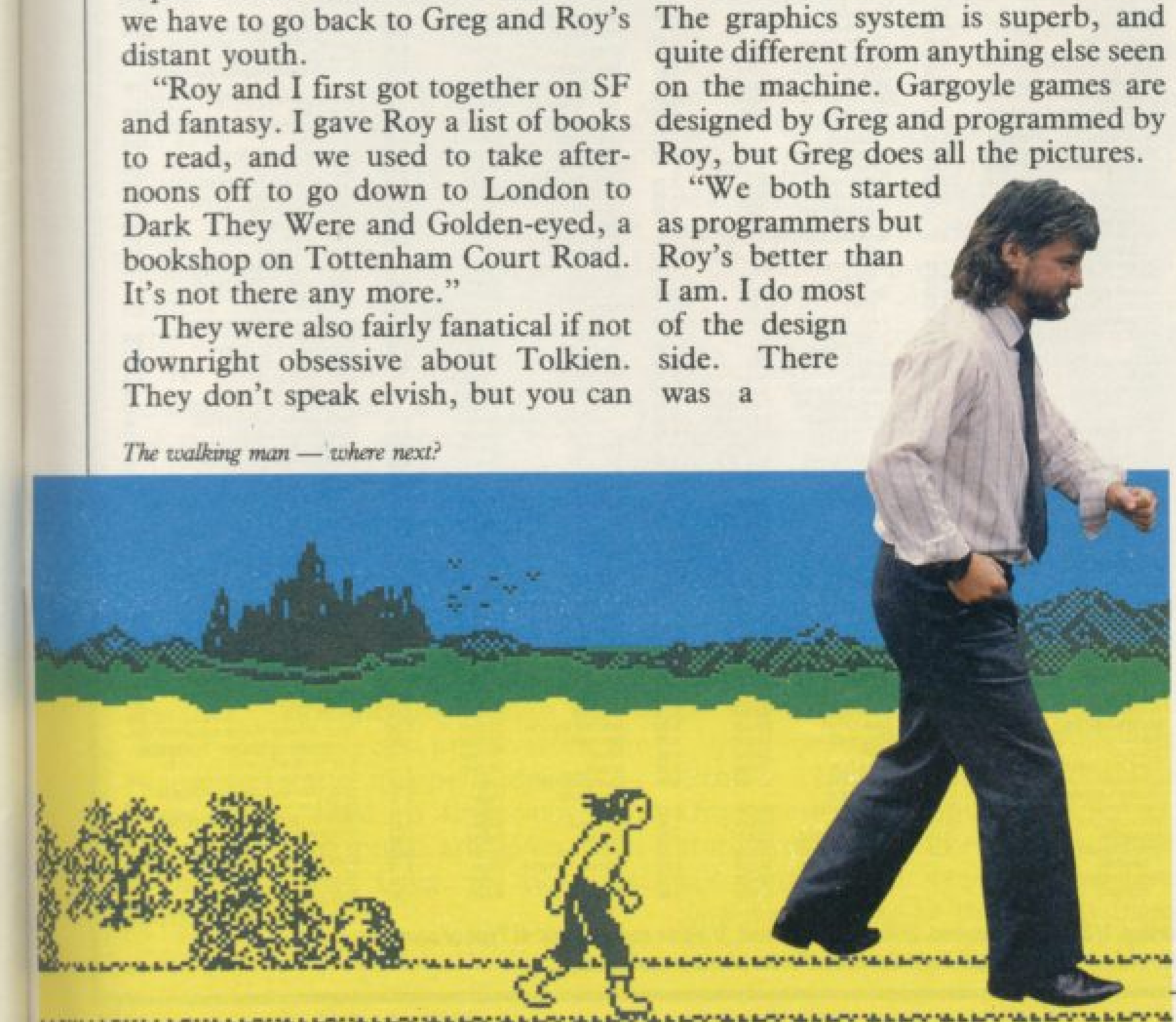
During the casting, they managed to hook into the Irish myths of Cuchullain, the mighty warrior. "We realised that it wasn't just Irish, it was a full Celtic mythos right across Europe."

Then they saw the TV series *Robin of Sherwood*, full of celtic magic and mystery, which so upset Mary Whitehouse. "It was lovely. It had that super soundtrack by Clannad and it was a clincher for a Celtic game."

In **Tir na Nog** Cuchullain seeks the seal of Calum in the land of the dead. The graphics system is superb, and quite different from anything else seen on the machine. Gargoyle games are designed by Greg and programmed by Roy, but Greg does all the pictures.

"We both started as programmers but Roy's better than I am. I do most of the design side. There was a memorable day when Roy laboriously drew a picture of a duck. He looked up and said 'Do ducks have big ears?' He's never done a picture since."

The walking man — where next?



They're quite modest about their own programming skill, but at the same time they don't enthuse about anybody else's. One of their strengths is the sheer volume of experience they have in programming. "Looking back," says Greg, "I don't know why we didn't write **Dun Darach** four years ago. We could have, and it was easy to sell software then. We'd have made a million."

Dun Darach was begun on February 10, 1985. "We were very lazy in December and January," admits Greg. Although **Dun Darach** looks very similar they both swear the coding is completely different, with only the central character and the scroll routines the same. **Dun Darach** is set in a Celtic metropolis, an enchanted city where Skar the sorceress has imprisoned Loeg, Cuchullain's friend and charioteer.

You have to map the city, discover a number of secret doors, collect objects and solve visual puns and puzzles to put them in the correct place, crack a combination lock, and work out the motives of at least a dozen independent characters, such as Mhor the gentlewoman, forlornly in love with Dain the bard, or Ryde, who acts as policeman but in reality longs to put out to sea again and return to his home Galicia.

Dun Darach was originally much larger than the 55 streets it now comprises. Unfortunately it took far too long to find the other characters when you needed them — although a street can be stored in memory in about 30 or 40 bytes, the characters took up a lot of space, and adding more would have been prohibitive.

Censorship also reared its ugly head. If you've mapped **Dun Darach**, you'll notice an empty space in the centre of the city. The locked location, Lady Q's, in the pleasure quarter Iomain, is a brothel, and originally opened onto a scene with courtesans, and in turn onto a whole red light district at the centre of the city. Now all you see is a sign saying 'Forbidden' and the moral conscience of distributors and retailers is appeased.

They even had to slow down the speed of the central character, Cuchullain. His slowness, which seems impressively fast given the complexity of

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the animation, is simply because the other characters have to use the same movement routines, and Cuchullain kept walking straight into them with no time to dodge. In the new game, **Marsport**, the central figure is speeded up a little.

"The coding is *completely* different for **Marsport**," insists Greg, but wilts somewhat when Royston says he agrees that people may say it looks the same. Purely superficially, of course.

"Look, when you buy an adventure you're buying the story, not the text interpreter," says Roy. And he does maintain that **Tir na Nog** and **Dun Darach** are adventures, which seems obvious unless you're a dyed-in-the-wool purist who still thinks Scott Adams is the finest living blah blah blah. (© Keith Campbell, 1982, 1983, 1984 1985 . . .)

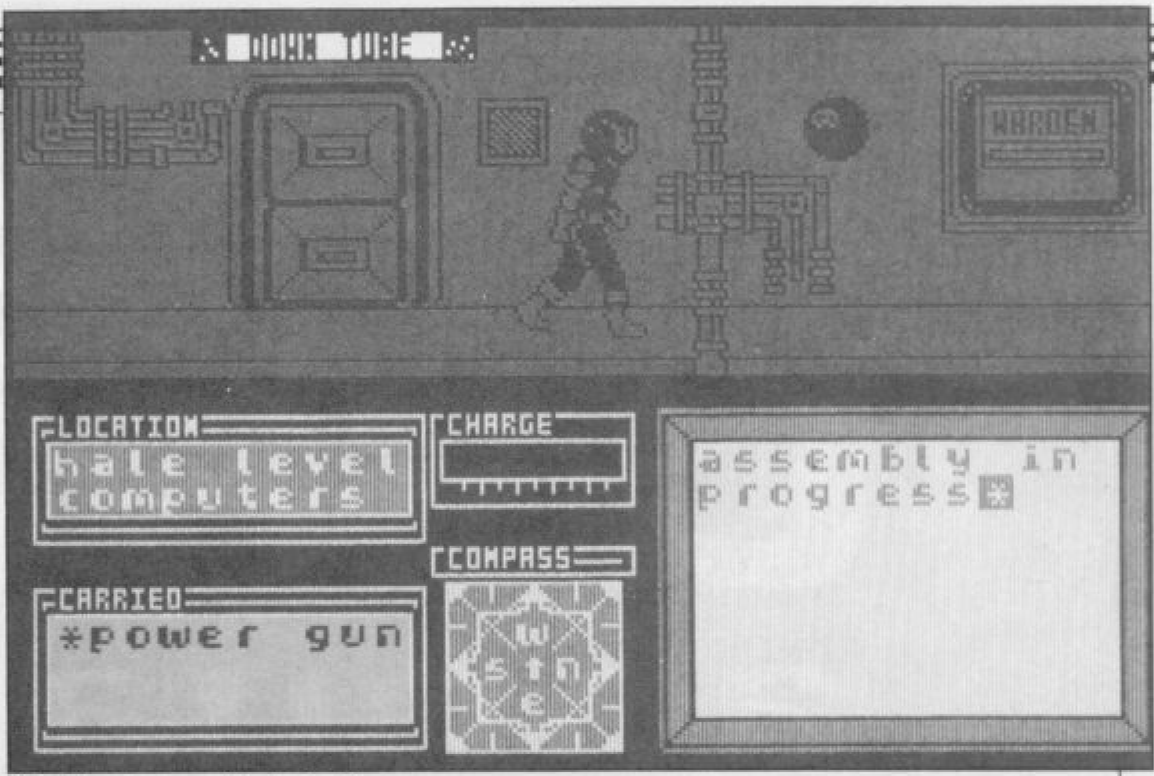
"I hate owning up," says Greg.

Marsport is clearly bigger than either forerunner, and with its SF theme is a new departure for Gargoyle. In fact, with two fantasy games and then a SF trilogy projected, Gargoyle appears to be following in the footsteps of Level 9, which started with the famous Middle Earth trilogy and followed that with the **Snowball** series of text adventures. Level 9 is one of the few companies Greg and Roy will admit to admiring.

In **Marsport** you take the role of John Marsh, sent to the abandoned dome on Mars to recover the plans for strengthening Earth's own dome against the insect Sept race.

True to Gargoyle style, the scenario is supported by a grandiose background of future history. The instruction booklet has five pages of it, all about the development of the Craig Effect force field and the emergence of the Sept as man's enemy.

As well as the hero there are the enemies to contend with, in the form of droids which automatically guard the dome and the Sept themselves. You can blast them if you have the right weapons, and although the problems and layout have the same overall style as the earlier games, there are much more of them — over 800 paths, 200 locations for objects and scores of puzzles. Since the city is built on 10 levels, and connected by elevators, the game will be a mapper's delight — very, very, hard to find your way around. "The puns are even more atrocious," says Greg, of the visual problems.



John Marsh meets a Warden in Marsport

"Our games represent a development of technique," he adds. "**Alien 8** was a sideways step from **Knight Lore**. That's not to detract for Ultimate — though they're a little arrogant, perhaps. We should be so arrogant."

"We should be so wealthy" chips in Roy.

"I'll agree with that," says Greg.

Apart from the atmosphere, clearly of vital importance, the Celtic games had two other keys to success. "Firstly the animation," says Greg, "which was eye-catching — there was nothing like it at the time. Secondly the depth — considerably more than most. The amount of gameplay is very large."

The one thing they haven't touched on in their games is sound effects, beyond the odd blip. "We manfully sit and accept the criticism," admits Greg. "We initially thought of having Holst's *Planet Suite* running through **Marsport**, but it would have to be perfect and add to the game."

"Pleasant little tunes wouldn't apply," says Roy.

"If you want sound on **Dun Darach** stick Clannad or Mike Oldfield on the record player," Greg suggests. "We've got no objections."

Another game to look forward to is **Sweevo's World**, which Greg says will be a Gargoyle Games Special Edition — Just for Fun. "We're making it very clear that it's an arcade adventure. And if it doesn't have you rolling about on the floor, what more do you want?"

Sweevo stands for Self-Willed Extreme Environment Vocational Organism, which means it's a very stupid robot which keeps falling over. It's a jump 'n' dodge game and Greg says it's going to be thoroughly bizarre, with characters like "the dreaded little skipping girl who hits you over the head with a mallet."

Fornax, the second part of the **Marsport** series, will be back to serious stuff again, and Greg swears there will be a completely different graphics system, but he won't say what. "We're thinking of black ink on black paper," he says. "There's one thing about being someone who likes fantasies — it has to be be as good for you as it is for everyone else. I admire Level 9 because they obviously enjoy the games themselves — I thought **Return to Eden** was particularly gleeful."

You can't accuse Roy and Greg of not being gleeful. They love games, even if they have no time to play them any more.

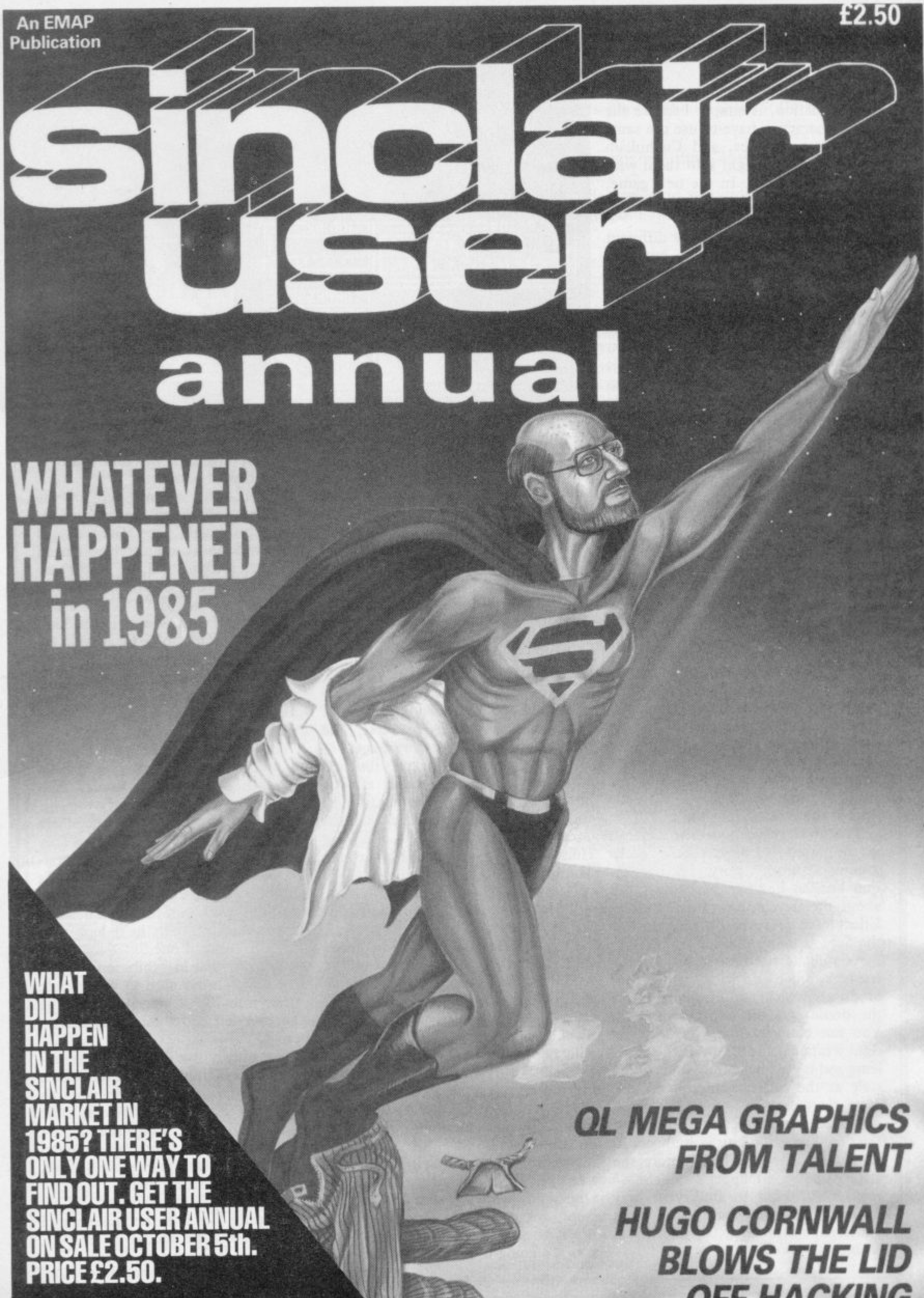
"I can see every reason to encourage kids to play computer games — if only so they won't be frightened of computers in 10 years time. We grew up in a system where we found a £250,000 machine wouldn't sell because a businessman thought he'd look silly sitting in front of one."

"We saw that in exhibitions," adds Roy. "We always used to incorporate games into the display, because the customer felt better for being able to beat it."

"Eventually we'll go back to research," says Greg, "but with our own company. Deep down inside, research programmers and analysts want to be God and create life. Come the time we have holographic and sensurround TV, think of the games we'll have. Oh, we'll be writing them."

And, with an afterthought, "What we'd really like is to be spacemen. I expect we will be, too."

See you on the moon, Greg.


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Converting binary to decimal and chasing stray numbers. Andrew hewson is all fingers and thumbs

Errors caused by rounding-up



THE FIRST letter comes from Martin Summers of Leeds. He is worried that his Spectrum is at fault because it will not pass beyond line 20 in the following:

```
10 IF INKEY$ = "" THEN GOTO 10
20 IF INKEY$ <> "2" OR INKEY$ <> "P" THEN GOTO 10
```

Apparently, Martin's Spectrum always jumps to line 10 whenever that line is encountered.

Let us inspect Martin's two lines. In line 20 he is trying to determine whether either of the two keys '2' or 'P' is being pressed. If so then he wishes to proceed to the next line. If neither is being pressed then he wishes to return to line 10 to try again.

Unfortunately, line 20 does not say what Martin would like it to say. It contains two propositions joined by the OR logical operator. If either of the propositions is true then the program will return to line 10. The only occasion in which the program will proceed beyond line 20 will be if both propositions are false simultaneously.

The first proposition is that the key being pressed is not the '2' key so that proposition will be false only when the '2' key is being pressed. The second proposition is similarly constructed. It is not possible to press both keys at the same time and have both results detected by the INKEY$ instructions, hence both propositions cannot be false simultaneously. The Spectrum is behaving perfectly properly in refusing to proceed beyond line 20.

In what way should Martin change his program so that it functions as he originally intended? The most important thing to aim for is simplicity. It is very easy to get bogged down in complicated constructions which on closer inspection can be shown to be incorrect. I would use something like the following:

```
10 IF INKEY$ = "2" OR INKEY$ = "P" THEN GOTO 30
20 GOTO 10
```

Finally, I always avoid the use of the NOT operator as a matter of principle. It is possible to restructure a program to omit NOT.

Richard Hampton of Thornton Heath writes: **I read your Helpline in February about the effect which rounding errors can have. Can you explain how numbers are converted to and from decimal, leading to the rounding errors problem?**

The decimal system of counting has become universally established for everyday purposes because humans have 10 fingers and can conveniently count in powers of ten. Digital computers, however, count using bits which can be in one of only two states. It is as if they had lots of hands but each hand had only two fingers.

Unfortunately, the binary form of a number, written as a string of zeros and ones, is cumbersome for mere humans because large numbers of digits are often required. In the ZX-81 and the Spectrum the bits are grouped together in bytes containing eight bits each, so that those computers can hold a single positive integer number in the range of 0 to 255 decimal in each memory location.

It is usually convenient to consider bytes to be the fundamental unit of memory and ignore the constituent bits. Hexadecimal notation — numbers written in base 16 — are conventionally used to represent bytes because two hexadecimal digits only are required. However, I shall continue to use the decimal version here.

Given that it is necessary to convert numbers from the decimal form to binary, it is logical to use a binary format which is efficient for the computer to use. Two separate formats are used on the Spectrum, a special format for integers — whole numbers — lying in the range −65535 to 65535, and a floating point format for all other numbers. The ZX-81 uses the floating point format only.

The integer format is the simplest to understand. A suitable number, N, is converted to the five bytes form by

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setting the first and fifth bytes to zero, and using the second byte to indicate the sign of the number (0 for positive, 255 for negative). If the number is positive, the value is stored in the third and fourth bytes as: third byte = N−256 * INT (N/265); fourth byte = INT (N/256).

If N is negative the two bytes contain: third Byte = 65536 − N − 256 ★ INT ((65536 − N)/256); fourth Byte = INT ((65536 − N)/256).

The principal advantage of that integer format is that for positive integers the third and fourth bytes are in exactly the form which the Z80A microprocessor uses when addressing locations in memory. Therefore, commands such as PEEK and POKE are executed much faster than they would otherwise be if the more complex floating point form were used to store the addresses to which they refer.

The program in table one, which looks at the first 21 bytes in the Spectrum program area, can be used to inspect the positive integer form by varying the first line. For example, entering

5 LET A=47

will show that 47 is held as 0,0,47,0,0. Those five bytes follow the characters representing the decimal form of the number and the byte which tells the LIST routine to hide the five bytes from human inspection. The negative version of a number cannot be inspected using that program because all numbers are stored in their positive form in the hidden bytes. If a number is preceded by a negative sign it is negated when the line is executed.

The program in table two gives the five byte form of any number, positive or negative, entered from the keyboard. The program prints the contents of the first item in the variables area — the number N — entered from the keyboard because it is the first variable declared in the program. Note that the program should be initiated by entering RUN rather than GOTO 10 because doing so will cause the variables area to be cleared, thus ensuring that N is the first variable.

The floating point form is designed to provide the computer with a systematic method of retaining as much accuracy as possible in any given calculation. Some numbers cannot be completely specified in decimal form. The same problem occurs when binary arithmetic is used.

The solution is to retain only the

```
5       LET A = 1
10      PRINT "BYTE";TAB 6;"CONTENTS";TAB 16;"CHARACTER"
15      LET S = PEEK 23635 + 256 * PEEK 23636
20      FOR I = S TO S + 20
25      PRINT I;TAB 8;PEEK I;TAB 20;CHR$ PEEK I
30      NEXT I
```

Table 1. A program which looks at the first 21 bytes of the program area.

```
10      INPUT N
20      PRINT N;"   ";
30      LET A = PEEK 23627 + 256
        * PEEK 23628
40      FOR I = A + 1 TO A + 5
50      PRINT PEEK I;"   ";
60      NEXT I
70      GOTO 10
```

Table 2. A program to inspect the five byte form of a number entered by the user.

most significant digits at each stage in a calculation. Provided more significant digits are retained than are required in the answer, then the calculated result will be accurate enough for practical purposes.

The program listed in table three calculates and prints the floating form of a number entered by the user. The line numbers have been set so that it can be placed in memory at the same time as the inspection program in table two. By entering the same number into both programs you will see that the calculation is correct.

The program has two parts. The first part stores the sign, S, of the number, X, entered by the user. It then multiplies the absolute value of X successively by two until the result exceeds two raised to the power 31 (2147483648). The number of multiplications executed is stored in N. The new value of X now lies necessarily between two to the power 31 and two to the power 32, and so the integer part of the number can be stored exactly in 31 bits.

By discarding the fractional residue the number can be stored in four bytes, each containing eight bits, with one bit left over to hold the sign of the number. The four bytes together are called the mantissa.

The second part of the program calculates the values held in each of the four bytes and stores them in the variables A, B, C and D and then prints the variables. An adjustment is made to the value of A depending on the sign of the original number. In effect, A is less than 128 for positive numbers and greater than or equal to 128 for negative numbers.

The fifth byte of the floating point form is used to store the exponent — the number of times that the mantissa must be divided or multiplied by two in order to place the decimal point in the correct position. The program

```
10      LET N = 0
20      INPUT X
30      LET S = SGN X
40      LET X = ABS X
50      LET X = 2 * X
60      LET N = N + 1
70      IF X < 2147483648 THEN GOTO 30
80      LET A = INT (X / 16777216)
90      LET X = X - 16777216 * A
100     LET B = INT (X / 65536)
110     LET X = X - 65536 * B
120     LET C = INT (X / 256)
130     LET D = X - 256 * C
140     PRINT "EXPONENT = ";160 - N
150     PRINT "MANTISSA = ";A - 128 *
        (S=1);" ";B;" ";C;" ";D
```

Table 3. A program to calculate and print the floating point form of a number entered from the keyboard.

calculates that number using N.

The result is adjusted by adding 160, so that numbers greater than one have exponents greater than or equal to 128, and numbers less than one have exponents less than 128.

If a number with an absolute value greater than 4294967296 — two raised to the power of 32 — is entered into the program in table three the result will be incorrect, because there is no provision for successive division by two to yield a number in the required range. It is quite easy to adjust the program to perform such successive divisions.

● *Please address problems and queries to Andrew Hewson, Helpline, Graham Close, Blewsbury, Oxfordshire.*

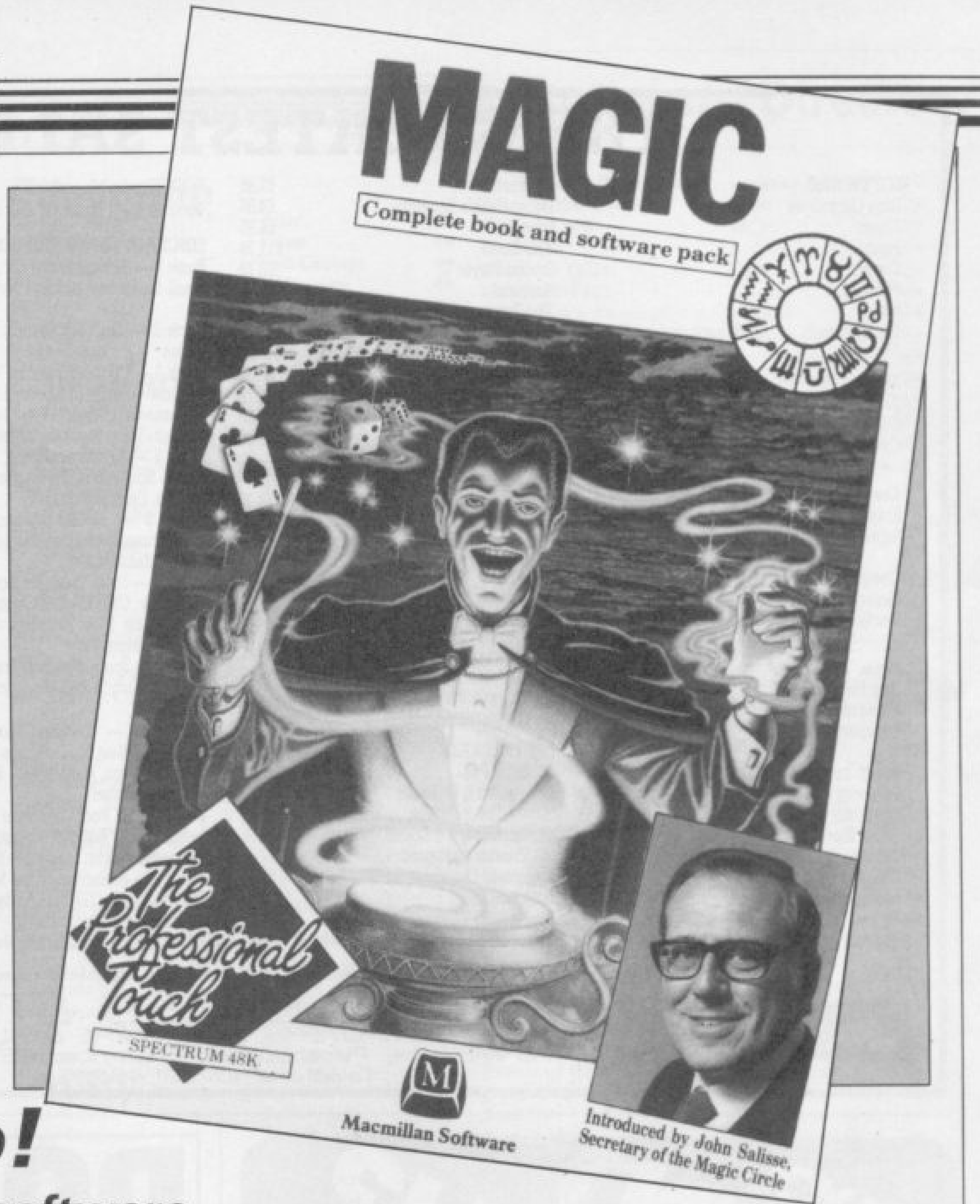
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The picture shows a series of cards, a single suit from Ace to King. They are arranged in a special order — but the positions of three cards — the 4, 8 and 10 — are not known.

The cards are arranged so that each card will be spelled out in order. This is how it's done: you take the stack of 13 cards, and spell out A-C-E, one card for each letter, and putting each card on the bottom of the stack in turn. The next card you turn up will be the Ace. Remove if from the stack, and then spell T-W-O, again one card per letter, putting each card on the bottom in turn. The next card will be the two, and that is removed. Continue until you have one card left in your hand, the King.

We want to know the positions of the three unknown cards. Write the numbers in order on a postcard; for instance, if you think the 10 comes first, then the four, then the eight, you would write 10,4,8. It's probably easiest if you experiment with a set of cards yourself!

When you have solved the problem, you have a trick you can use for real on your friends. Arrange a suit of cards — say, hearts — in the correct order and have them on the top of the pack before you start.

Shuffle the pack by cutting it in half and riffling the two halves together. The 13 cards which were at the top are still in the same order but scattered through the top half of the pack. If you want to be really flash, cut the top two-thirds of the pack or so — to make sure you get all the hearts in the top part — and riffle shuffle again.

Now you can take out all the hearts, from an apparently shuffled pack, and they will still be in the right order. Explain that the hearts, being romantic cards, are always in harmony, and demonstrate it by spelling out the name of each one in turn.

THE Gilbert Factor has been replaced by a star rating, the basis of which is value for money. Programming, graphics, speed, presentation and addictive qualities are taken into account.

Guide to ratings:
★★★★★24 carat. Buy it
★★★★Value for money
★★★Nothing special
★★Over-priced
★A rip-off

SPECTRUM 16K

Adventure

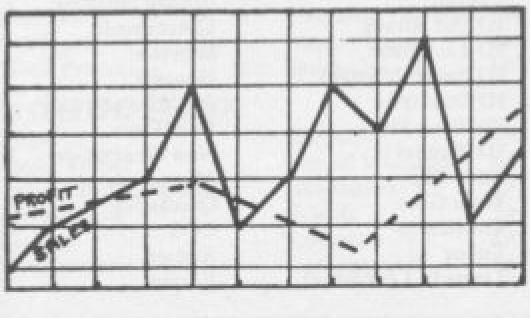
Planet of Death	Artic	3★

Arcade

Arcadia	Beau Jolly	3★
Arcadian	J K Greye	3★
Black Hole	Quest	3★
Blind Alley	Sunshine	4★
Cosmic Guerilla	Crystal	4★
Crazy Cranes	Voyager	3★
Crevasse and Hotfoot	Microsphere	4★
Cyber Rats	Silversoft	4★
Death Chase	Micromega	3★
Earth Defence	Artic	3★
Escape	New Generation	4★
Fireflash	Abacus	3★
Fruit Machine	DK'tronics	3★
Galaxians	Artic	3★
Gnasher	Mastertronic	2★
Godzilla and Martians	Temptation	4★
Ground Attack	Silversoft	3★
Horace and the Spiders	Sinclair	4★
Horace Goes Skiing	Sinclair	3★
Hungry Horace	Sinclair	4★
Invasion Force	Artic	4★
Jet Pac	Ultimate	5★
Luna Crabs	Micromega	4★
Maze Chase	Hewson	4★
Meteor Storm	Quicksilva	4★
Meteoroids	DK'tronics	4★
Micro Mouse	Lothlorien	3★
Millypede	Add-on	4★
Mined Out	Quicksilva	4★
Mr Wong's Loopy Laundry	Artic	3★
Muncher	Silversoft	3★
Orbiter	Silversoft	4★
Pengy	Micromania	2★
Planetoids	Sinclair	3★
Proteus	Abacus	3★
Rider	Virgin	3★
Road Toad	DK'tronics	4★
Sentinel	Abacus	4★
Sheer Panic	Visions	4★
Sir Lancelot	Melbourne House	4★
Space Intruders	Quicksilva	4★
Space Raiders	Sinclair	3★
Spec. Scramble	Work Force	4★
Spectipede	Mastertronic	3★
Spectral Invaders	Bug-Byte	4★
Spectral Panic	Hewson	3★
Strike Four	Spectresoft	2★
Tank Battle	dk'tronics	4★
Train Game	Microsphere	5★
Winged Warlord	CDS	3★
Yomp	Virgin	4★

Business

Finance Manager	OCP	5★
Survey II	Lobos	3★
Vu-Calc	Sinclair	4★
Vu-File	Sinclair	4★



Education

Chess Tutor	Artic	4★
Estimator Racer	Psion	4★
Firework Music	Soft Cottage	4★
Integration	University	4★
Money	Poppy	4★
Number Painter	Psion	4★
Regression	University	4★

Language

Beta Basic	Betasoft	5★

Practical

Countries of the World	Hewson	4★
Cycle Planner	Medidata	2★
Map of the UK	Kuma	4★

Puzzle

Flippit	Sinclair	4★
Hanoi King	Contrast	4★
Lojix	Virgin	2★
Nowotnik Puzzle	Phipps	4★

Simulation

Air Traffic Controller	Hewson	3★
Airliner	Protek	3★
Golf	Virgin	4★
NightFlite	Hewson	3★
Print Shop	CCS	4★
Pro-Golf	Hornby	4★

Strategy

Dallas	CCS	3★
Dictator	DK'tronics	4★
Heathrow	Hewson	4★

Traditional

Bridge Tutor	CP Software	4★
Bridgemaster	Serin	5★
Las Vegas	Temptation	3★
Pool	Bug-Byte	4★
Reversi	Sinclair	4★

Utility

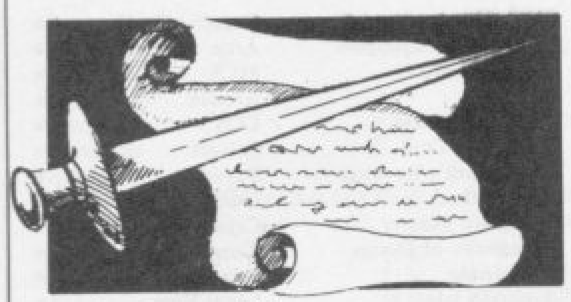
Auto Sonics	Buttercraft	3★
Basic Utilities	Jaysoft	3★
Dietron	Custom	3★
Disassembler	DK'tronics	4★
Editor/Assembler	Picturesque	4★
Extended Basic	CP Software	4★
FP Compiler	Softek	5★
Friendly Face	Monitor	4★
Letterfont	Allanson	4★
Machine Code Test Tool	OCP	4★
Master Toolkit	OCP	4★
MCoder	PSS	4★
Print Utilities	Sinclair	4★
Slow Loader	ELR	5★
Sound FX	DK'tronics	3★
Spec. Editor/ Assembler	Picturesque	4★
Spec. Monitor	Picturesque	4★
Spectrum Super Toolkit	Nectarine	4★
Supercode	CP	4★
Trace	Texgate	4★
TT-S	Timedata	4★

SPECTRUM 48K

Adventure

Abyss	CCS	3★
Adventure 1	Abersoft	3★
Alchemist	Beau Jolly	4★
Amulet	Sentient Software	2★
Ancient Quests	Mirrorsoft	4★
Ashkeron	Mirrorsoft	3★
Assignment East Berlin	Sterling Software	2★
Atlas Assignment	Virgin	4★
Black Crystal	Mastervision	4★
Black Planet	Phipps	4★
Bored of the Rings	Delta 4	5★
Caesar's Travels	Mirrorsoft	2★
Castle Blackstar	CDS	4★
Classic Adventure	Melbourne House	4★
Colditz	Phipps	4★
Colossal Caves	CP Software	4★
Confidential	Radar Games	4★
Crystal Frog	Sentient Software	3★
Crystal Quest	Pocket Money	5★
Curse of the Seven Faces	Imperial Software	3★
D. Mouse in Black Forest	Creative Sparks	4★
Dead at the Controls	Artic	2★
Demon Lord	MCE	3★
Detective	Arcade	4★
Diamond Quest	CCS	2★
Diamond Trail	Gilsoft	4★
Doomdark's Revenge	Beyond	5★
Dun Darach	Gargoyle	5★
Dungeon Master	Crystal Comp.	4★
Dungeons of Doom	Temptation	2★
El Dorado	Atlantis	4★
Emerald Isle	Level Nine	4★
Erik the Viking	Level Nine	4★
Espionage	Modular Resources	2★
Espionage Island	Artic	3★
Eureka	Domark	3★
Everest Ascent	Shepherd	3★
Eye of Bain	Artic	4★
Fantasia Diamond	Hewson	4★
The Final Mission	Incentive	4★
Flight from the Dark	Hutchinson	4★
The Fourth Protocol	Century/Hutchinson	5★
Frankie goes to Hollywood	Ocean	5★
Frog Face	Positive Image	4★
Ghoulies	IMS Software	4★
Golden Apple	Artic	4★
Gremlins	Adventure Int	3★
The Great Space Race	Legend	2★
Halls of Things	Crystal Comp.	5★
Hampstead	Melbourne House	5★
The Helm	Firebird	4★
Here comes the sun	Alligata	4★
Heroes of Karn	Interceptor	3★
Hobbit	Melbourne House	5★
Ice Station Zero	8th Day	3★
Inca Curse	Artic	3★
Inferno	Shepherd	4★
Invincible Island	Shepherd	4★
Island	Crystal	2★
Jericho Road	Shards	4★
The Jewel of Power	Slogger Software	4★
Jewels of Babylon	Interceptor	2★
Jungle Adventure	CCS	2★
Kentilla	Micromega	3★
Key of Hope	Games Workshop	4★
King Arthur's Quest	Hill MacGibbon	2★
Knight's Quest	Phipps	3★
Leopard Lord	Add-on	2★
Lords of Midnight	Beyond	5★
Lords of Time	Level Nine	4★
Mad Martha	Mikro-Gen	4★
Malice in Wonderland	Sentient Software	3★
The Magic Sword	Database Pubs	3★
Mountains of Ket	Incentive	4★
Morden's Quest	Melbourne House	5★
Murder at Manor	Gemtime	4★
Odyssey of Hope	Martech	3★
Operation Nightingale	Softly Softly	3★
Oracle's Cave	Doric	4★
Orc Slayer	Gamma Software	3★
Paradox	Runesoft	1★
Perseus and Andromeda	Channel 8	4★
Phineas Frogg	Mirrorsoft	4★
Pimania	Automata	4★
The Prince	CCS	4★
The Prisoner	Spoof Software	3★
Project X	Compass Software	4★
Quest	Hewson	4★
Quetzalcoatl	Virgin	4★
The Rats	Hodder/Stoughton	5★
Red Moon	Level 9	5★
Return of the Joystick	Delta 4	3★
Return to Eden	Level Nine	4★
Robin of Sherwood	Adventure Int	5★
Runestone	Games Workshop	4★
Runes of Zendos	Dorcas Software	3★
The Sandman Cometh	Star Dreams	4★
Satan's Pendulum	Minatron	4★
Scoop	Sentient Software	3★
The Secrets of St Bride's	St Bride's	5★
Se-Kaa of Assiah	Mastervision	2★
Sherlock	Melbourne House	5★
Ship of Doom	Artic	4★
Snowball	Level 9	5★
Sorderon's Shadow	Beyond	5★
Spoof	Runesoft	4★
Subsunk	Firebird	4★
Superspy	Shepherd	3★
System 15000	Craig Comm.	5★

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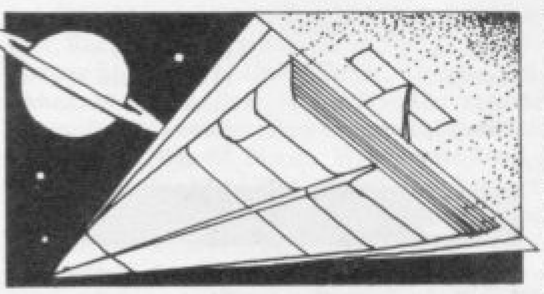


continued on page 121

Title	Publisher	Rating
The Talisman	Games Workshop	4★
Temple of Vran	Incentive	4★
Terrormolinos	Melbourne House	5★
Timesearch	Millenium	3★
Tinderbox	Gremlin Graphics	1★
Tir Na Nog	Gargoyle	5★
Titanic	R&R	3★
Tower of Despair	Games Workshop	3★
Transylvanian Tower	Shepherd	3★
Twin Kingdom Valley	Bug-Byte	4★
Underworld	Orpheus	3★
Urban Upstart	Shepherd	4★
Valhalla	Legend	5★
Vampire Village	Terminal	2★
Velnor's Lair	Quicksilva	4★
Volcanic Dungeon	Mastervision	3★
Warlord	Interceptor	3★
War of the Worlds	CRL	2★
Waydor	IMS Software	2★
Width of the World	Mosaic	2★
The Wild Bunch	Firebird	2★

Arcade

Title	Publisher	Rating
Abu Simbel Profanation	Gremlin Graphics	4★
Action Biker	Mastertronic	1★
A Day in the Life	Micromega	4★
A View to a Kill	Domark	4★
Ad Astra	Gargoyle Games	4★
Adven. of a St Bernard	Mastertronic	4★
Airwolf	Elite	2★
Alcatraz Harry	Mastertronic	2★
Alien 8	Ultimate	5★
Android Two	Vortex	5★
Ant Attack	Quicksilva	5★
Arabian Nights	Interceptor	4★
Archon	Ariolasoft	2★
Arena 3000	Microdeal	3★
Armageddon	Silversoft	2★
Astronut	Software Projects	4★
Atic Atac	Ultimate	5★
Automania	Micro-Gen	3★
Avalon	Hewson	5★
Base Invaders	Work Force	3★
Battle Zone	Quicksilva	3★
Bazam	Alan Firminger	3★
Beach Head	US Gold	4★
Bear Bovver	Artic	4★
Birds and Bees	Bug-Byte	4★
Black Hawk	Creative Sparks	4★
Blade Alley	PSS	3★
Blue Max	US Gold	3★
Blue Thunder	Foundry Systems	3★
BMX Trials	Lainlan Software	2★
Booty	Firebird	4★
Boulder Dash	Front Runner	3★
Brian Bloodaxe	The Edge	4★
Brian Jack's Challenge	Martech	2★
Bristles	Statesoft	3★
Bruce Lee	US Gold	4★
Buck Rogers	US Gold	2★
Bugaboo	Quicksilva	4★
Buzz Off	Electric	3★
Caesar the Cat	Mirrorsoft	4★
Carnival	Eclipse	3★
Carpet Capers	Terminal	3★
Cauldron	Palace	5★
Cavelon	Ocean	4★
Centipoid Plus 3	Orwin	3★
Chaos	Games Workshop	4★
Chequered Flag	Sinclair	5★
Chinese Juggler	Ocean	3★
Chocolate Factory	Hill MacGibbon	3★
Chuckie Egg	A & F	5★
Chuckie Egg II	A & F	3★
Chuckman	CCI/Add-on	4★
Close-In	Pulsonic	2★
Codename Mat	Micromega	5★
Codename MAT II	Domark	3★
Confuzion	Incentive	4★
Corridors of Genon	New Generation	5★
The Covenant	PSS	2★
Crusoe	Automata	3★
Cyclone	Vortex	4★
Cylu	Firebird	4★
Daley's Decathlon	Ocean	5★
Dangermouse in D. Trouble	Creative Sparks	4★
Death Chess 5000	Artic	4★
Death Star Interceptor	System 3	1★
Defusion	Incentive	3★
Defusion/Worms	K-Tel	2★
Demon Chase	Mansfield	2★
Deus Ex Machina	Automata	5★
Devil Rides In	Mastertronic	4★
Dimension Destructors	Artic	4★
Dodge City	Phoenix	4★
Don't Buy This	Firebird	2★
Dr Franky and the Monster	Virgin	3★
Dragonfire	Cheetahsoft	3★
Dragontorc	Hewson	4★
Driller Tanks	Sinclair	2★
Drive In	Fantasy	2★
Dynamite Dan	Mirrorsoft	5★
Energy 30,000	Elm	2★
Eric and the Floaters	Sinclair	3★
Everyone's a Wally	Mikro-Gen	4★
Exodus	Firebird	2★
Falcon Patrol II	Virgin	3★
Falklands Crisis	Lainlan Software	2★
Fantastic Voyage	Quicksilva	4★
Frankenstein 2000	Icon	2★
Frank N Stein	PSS	4★
Fred	Quicksilva	3★
Froot Loop	NTD Software	3★
Galaxy Attack	Sunshine	2★
Ghostbusters	Activision	4★
Ghost Rider	Positive Image	2★
Giant's Revenge	Thor	2★
Gift from the Gods	Ocean	3★
Gilligan's Gold	Ocean	3★
Glass	Quicksilva	4★
Glug Glug	CRL	3★
Go To Hell	666	3★
The Guardian	PSS	3★
Havoc	Dynavision	1★
Harry Goes Home	Pulsonic	3★
Helichopper	Firebird	2★
Hellfire	Melbourne House	4★
Herbert's Dummy Run	Mikro-Gen	4★
Hickstead	CCS	2★
High Noon	Work Force	5★
Highway Encounter	Vortex	5★
Hunchback	Ocean	4★
Hunchback II	Ocean	3★
Hypersports	Imagine	4★
Icicle Works	Statesoft	2★
Invasion Body Snatch.	Crystal	5★
Jack and the Beanstalk	Thor	3★
Jasper	Micromega	3★
Jet Set Willy	Software Projects	5★
Jet Set Willy II	Software Projects	3★
Jump Challenge	Martech	3★
Killer Knight	Phipps	3★
Knight Lore	Ultimate	5★
Knockout	Alligata	2★
Kokotoni Wilf	Elite	3★
Komplex	Legend	2★
Krakatoa	Abbex	4★
Kung-Fu	Bug-Byte	3★
Laser Zone	Quicksilva	4★
Laserwarp	Mikro-Gen	3★
Lazy Jones	Terminal Software	2★
Les Flics	PSS	3★
Locomotion	Mastertronic	4★
Lode Runner	Software Projects	3★
Loony Zoo	Phipps	3★
Lunar Jetman	Ultimate	5★
Magic Roundabout	CRL	2★
Manic Miner	Bug-Byte	3★
Matrix	Salamander	4★
Maziacs	DK'tronics	4★
Metabolis	Gremlin Graphics	4★
Metagalactic Llamas	Salamander	4★
Mighty Magus	Quicksilva	2★
Minder	DK'tronics	4★
Mission Impossible	Silversoft	3★
Mission Omega	Pulsonic	2★
Monkey Biznes	Artic	4★
Moon Cresta	Incentive	3★
Moons of Tantalus	Cornhill	3★
Monty is Innocent	Gremlin Graphics	4★
Monty on the Run	Gremlin Graphics	4★
Mr Wimpey	Ocean	4★
Mummy Mummy	Lothlorien	3★
Munnery's Mergatroids	Abacus	3★
Mutant Monty	Artic	4★
New Cylon Attack	A&F	3★
Nicotine Nightmare	Atlantis	2★
Night Gunner	Digital Integration	3★
Nightshade	Ultimate	5★
Nodes of Yesod	Odin	4★
Nonterraqueous	Mastertronics	3★
1994	Visions	2★
911TS	Elite	1★
Olympimania	Automata	3★
On the Run	Design Design	3★
Orion	Software Projects	3★
Paws	Artic	4★
Pedro	Beau Jolly	4★
Penetrator	Melbourne House	5★
Pi-Balled	Automata	4★
Pi-Eyed	Automata	3★
Pitfall II	Activision	3★
Popeye	DK Tronics	4★
Potty Pigeon	Gremlin Graphics	3★
Psi-Spy	Postern	3★
Pssst	Ultimate	4★
Psytron	Beyond	5★
Pyjamarama	Mikro-Gen	4★
Pyramid	Fantasy	4★
Quackshot	Creative Sparks	3★
Rapscallion	Bug-Byte	3★
Reactor	Gemini	4★
Revenge of the K. Tomatoes	Visions	3★
Rider	Virgin	3★
River Rescue	Creative Sparks	2★
Robot Riot	Silversoft	3★
Rocco	Gremlin	3★
Rocky Horror Show	CRL	3★
Roland's Rat Race	Ocean	4★
Rommels Revenge	Crystal	5★
Sabre Wulf	Ultimate	5★
Saimazoom	Silversoft	3★
Shadowfire	Beyond	5★
Shadowfire Tuner	Beyond	4★
Skooldaze	Microsphere	5★
Scuba Dive	Durrell	5★
Select 1	Computer Records	4★
Skull	Games Machine	3★
Sky Ranger	Microsphere	2★
Snapple Hopper	Macmillan	3★
The Snowman	Quicksilva	4★
Software Star	Addictive Games	2★
Sorcery	Virgin	4★
Space Station Zebra	Beyond	3★
Spectron	Virgin	3★
Spellbound	Beyond	4★
Splat	Incentive	4★
Sports Hero	Melbourne House	3★
Spy Hunter	US Gold	4★
Spy vs Spy	Beyond	5★
St Crippens	Creative Sparks	3★
Stagecoach	Creative Sparks	4★
Starbike	The Edge	3★
Starion	Melbourne House	4★
Stop the Express	Sinclair	4★
Strangeloop	Virgin	5★
Submarine Strike	Pulsonic	3★
Super Pipeline II	Taskset	3★
Tachyon Command	Century Software	1★
Talos	Silversoft	4★
Tank Trax	Mastertronic	2★
Tapper	US Gold	5★
Technician Ted	Hewson	4★
Terrahawks	CRL	3★
That's the Spirit	The Edge	4★
Therbo	Arcade Software	2★
3D Bat Attack	Cheetahsoft	3★
3D Lunattack	Hewson	3★
3D Seiddab Attack	Hewson	3★
3D Starstrike	Realtime software	4★
3D Tank Duel	Real Time	3★
3D Tunnel	New Generation	5★
Tiler Tim	Microwish	3★
Time Gate	Quicksilva	4★
Timebomb	CDS	4★
Tobor	Add-on	4★
Tornado Low Level	Vortex	5★



Toy Bizarre	Activision	3★
Trashman	New Generation	5★
Travel with Trashman	New Generation	4★
Traxx	Quicksilva	3★
Tribble Trubble	Software Projects	4★
Trom	DK'tronics	2★
Turtle Timewarp	Softstone	2★
Tutankhamun	Micromania	4★
Two-Gun Turtle	Lothlorien	4★
Valley of the Dead	Central Solutions	2★
Underwurlde	Ultimate	5★
Way of the Exploding Fist	Melbourne House	5★
Wheelie	Microsphere	4★
Witch's Cauldron	Mikro-Gen	4★
Wizard's Lair	Bubble Bus	4★
Wizard's Warriors	Mastertronik	2★
World Series Baseball	Imagine	3★
Worm Attack	Pulsonic	1★
Worse Things Happen at Sea	Silversoft	4★
Wrath of Magra	Mastervision	4★
Wriggler	Romantic Robot	4★
Xadom	Quicksilva	2★
Xavior	PSS Software	3★
Zenji	Activision	4★
Zig-Zag	DK'tronics	4★
Zombie Zombie	Quicksilva	4★

Business

Address Manager	OCP	4★
Banker	Andic Software	3★
Bank Account System	K Gouldstone	4★
Bizzicom	Merlin	1★
Cash Controller	Shepherd	4★
Classic Bookkeeping	Manx Tapes	3★
Collector's Pack	Sinclair	4★
Database	Microl	4★
Decision Maker	Collins	3★
Electric Office	Fisher Software	2★
Entrepreneur	Collins Soft	3★
Heathplanner	Heath Computing	4★
Home Budget	Kuma Computers	3★
Investment, Insurance, Information	Inform	3★
Invoicing/Accounting	Transform	4★
Keyfile	Keysoft	4★
Letta-Head	Bradway Software	3★
Lifeline	William Stuart	2★
Masterfile	Campbell	5★
Micropen	Contrast	3★
Mini Office	Database Pubs	4★
Money Manager	Creative Sparks	3★
Multi-File	ISP	3★
Omnicalc	Microsphere	5★
Personal Banking System	Hilton	4★
Personal Financ.		
Plumbers' Price	J Redman	3★
Profile 2	McGraw-Hill	3★
Projector 1	McGraw-Hill	4★
Sales Ledger	Hestacrest	4★
Spectext	McGraw Hill	4★
Spreadsheet	Microl	4★
Stock Manager	OCP	4★
Superfile	Transform Ltd	3★
Tasprint	Tasman Software	4★
Tasword	Tasman	4★
Tasword II	Tasman	5★
The Unitrust Program	Michael Slatford	3★
UNISTAT	University Software	3★
Va£Track	Morley Davies	4★
Word Processor	Quicksilva	1★

Education

Angle	Chalksoft	3★
Angle Turner	Arnold Wheaton	4★
Antony and Cleopatra	Akadamias	4★
Astro Maths	Scisoft	3★
Biology	Longman	4★
Blockbuster	Compusound	4★
Bodyworks	Genesis	2★
Castle	L'Ensouleiado	4★
Castle of Dreams	Widgit	4★
Castle Spellerous	Sinclair	4★
Chess Tutor 1	Sinclair	4★
Clown	Englefield Software	2★
Cortes	L'Ensouleiado	3★
Dinosaurs	Piper	3★
Disease Dodgers	Sinclair Research	5★
Dyslexia Beater	Dunitz	4★
Eiffel Tower	Chalksoft	3★
Electronic Learner's Guide	ETST	3★
French	Longman	4★
French is Fun	CDS	3★
Friend or Foe	Longman	3★
Viking Raiders	Firebird	3★
German is Fun	CDS	4★
Highway Code	Learning Systems	3★
Highwire	Englefield Software	2★
Hotline	Chalksoft	3★
Humpty Dumpty	Widget	4★
Inkosi	Chalksoft	3★
Learn to Read 1-5	Sinclair	4★
Light and Heat	Rose Software	4★
Linkword	Silversoft	3★
Look Sharp	Mirrorsoft	4★
Macman in the T. Caves	Sinclair Research	3★
Macman's Magic Mirror	Sinclair Research	4★
Mansfield Park	Sussex	4★
Maths	GCE Tutoring	3★
Mathskills II	Griffin	4★
MDA-PCSS	MDA Assoc.	4★
Merchant of Venice	Penguin Study	4★
Mr T's Measuring Games	Ebury	4★
Mr T Meets His Match	Ebury Software	3★
Musicmaster	Sinclair	3★
Nineteenth C. England	Sussex	4★
Oil Strike	Sinclair Research	4★
Paddington's Garden Game	Collins	4★
Pathfinder	Widget	4★
Physics	Longman	4★
Physics	Scisoft	4★
Pirate	Chalksoft	4★
Postman Pat's Trail Game	Longman	4★
Riddle of the Sphinx	Longman	3★
Run, Rabbit, Run	Longman	3★
Sequences	Chalksoft	3★
Snaffle	Longman	4★
Speech Marks	Sinclair	3★
Spelling Bee	Image Systems	3★
Startrucker	Widget	4★
Stuart Period	Akadamias	4★
SuperTed	Longman	3★
Teacher Data	B Farris	4★
Tense French	Sullis	4★
Weathermaster	Sinclair/Macmillan	4★
Weather Station	Arnold Wheaton	4★
Words and Pictures	Chalksoft	3★
Wordsetter	Sinclair/Macmillan	4★
Word Wizard	Longman	3★
Worldwise	Conflict & Peace	5★
Zoo	L'Ensouleiado	3★

Language

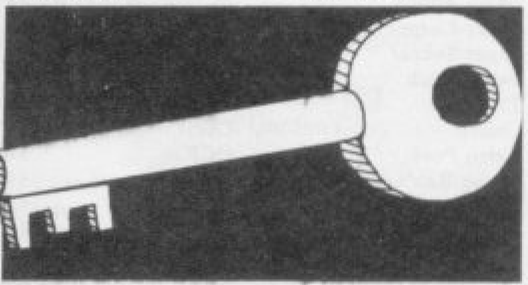
Beta Basic	Betasoft	5★
Forth	Melbourne House	5★
Forth	Sinclair	4★
48/80 Forth	ELR	4★
Hisoft C	Hisoft	5★
Logo	Sinclair	5★
Micro Prolog	Sinclair	4★
Snail Logo	CP	4★
Spec. Forth	Abersoft	5★
Spec. Forth	CP	4★
ZX Forth	Artic	4★

Practical

Astrocalc	Astrocalc	3★
Astronomer	CP Software	4★
Beamscan	Beamscan	5★
Car Cure	Simtron	1★
Computer Cookbook	Bug Byte	3★
Cricket Averages	Spartan CC	4★
Design your Garden	Blandford Press	1★
Diet Master	Diet Master	3★
Dietician	Keysoft	2★
First Aid	Eastmead	2★
How Long have you got?	Eastmead	3★
I Ching	Salamander	4★
Know Your Personality	Mirrorsoft	3★
Love Oracle	Solar Publishing	3★
Microfitness	V0²	4★
Psychedelia	Llamasoft	2★
Spacescan	Macmillan	2★
Star Gazer	CRL	4★
Statistics II	Bridge	1★
The Guide to Medicine	Eastmead	2★
Vega-Table	Vega	4★

Puzzle

Arcturus	Visions	3★
Computaword	Work Force	1★
Flix	Softricks	4★
Hareraiser	Haresoft	2★
Mazecube	PAL	3★
Stuart Henry's Pop Quiz	Bellflower	4★
3D Strategy	Quicksilva	4★



Simulation/Strategy

Airline	CCS	4★
Alien	Mind Games	4★
American Football	Mind Games	4★
Angler	Virgin	3★
Arnhem	CCS	5★
Ashes	Pulsonic	4★
Atram	PD Visual Marketing	3★
Barrington's Squash	New Generation	3★
Battle for Midway	PSS	3★
Battle 1917	CCS	4★
The Biz	Virgin	4★
Bryan Robson's S League	Paul Lamond	2★
Brewery	CCS	4★
The Bulge	Lothlorien	4★
Caribbean Trader	East Midland	4★
Combat Lynx	Durrell	4★
Confrontation	Lothlorien	4★
Confrontation Scenarios	Lothlorien	4★
Conquest	Cheetasoft	3★
Cricket Captain	Allanson	3★
Dam Busters	US Gold	5★
Dix Mille	CCS	3★
Fall of Rome	ASP	3★
Fighter Pilot	Digital Integration	5★
Flight Simulation	Sinclair	4★
Football Manager	Addictive Games	4★
The Forest	Phipps	4★
Formula One	CRL	5★
Full Throttle	Micromega	4★
Frank Bruno's Boxing	Elite	4★
Galaxy Conflict	Martech	4★
Gangsters	CCS	4★
Gatecrasher	Quicksilva	4★
Golf	Virgin	4★
Grand National	Elite	4★
Grand Prix Manager	Silicon Joy	1★
Great Britain Ltd	Hessel	4★
Gyron	Firebird	5★
Heathrow Int ATC	Hewson	4★
Howzat	Wyvern	4★
Hunter Killer	Protek	5★
It's Only Rock 'n' Roll	K-Tel	3★
Jack Charlton's Match Fishing	Alligata	3★
Juggernaut	CRL	3★
Match Day	Ocean	3★
Match Point	Sinclair	5★
Millionaire	Incentive	4★
Mugsy	Melbourne House	4★
New Birkdale	Hornby	4★
New Venture	Falcon	2★
Nick Faldo's Open	Argus	3★
1984	Incentive	3★
Oligopoly	CCS	4★
Olympics	CRL	3★
Overlords	Lothlorien	5★
Pole Position	Datasoft	3★
Plunder	CCS	4★

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Software Directory

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Red Arrows	Database	4★
Red Weed	Lothlorien	4★
Regards to Broadway	Argus	3★
Reichswald	MW Gamesworld	2★
Royal Birkdale	Ocean	4★
Run for Gold	Five Ways Software	3★
Scatterbrain	Manor	2★
747 Flight Simulator	DACC	2★
Ski Star 2000	Richard Shepherd	2★
Southern Belle	Hewson	4★
Special Operations	Lothlorien	2★
Spectrealm	Runesoft	3★
Star Trader	Bug Byte	3★
Steve Davis Snooker	CDS	4★
Stonkers	Beau Jolly	5★
Strike Attack	Micromart	2★
Super-League	Cross	3★
Super Soccer	Winters	2★
Test Match	Comp. Rentals	3★
Troon	Hornby	4★
United	CCS	2★
Video Pool	OCP	3★
Viking Raiders	Firebird	3★
War 70	CCS	4★
Whodunnit	CCS	4★
Wilfred the Hairy	Microbyte	1★
World Cup Football	Artic	4★
Yacht Race	Five Ways	5★

Traditional

Arcturus	Visions	4★
Backgammon	CP Software	4★
Brag	Turtle	4★
Bridge Master	Serin	4★
Bridge Player	CP Software	4★
Bullseye	Mastertronic	2★
Cluedo	Leisure Genius	3★
Derby Day	CRL	3★
Do Not Pass Go	Work Force	3★
Double Dealer	MFM Software	3★
Draughts	CP Software	4★
Mind Games	Oasis	4★
Monopoly	Leisure Genius	2★
Pontoon	Contrast	2★
Scrabble	Sinclair	5★
Super Bridge	Buffer Micro	4★
Superchess II	CP Software	4★
Superchess III	CP Software	5★
The Turk	OCP	4★
Voice Chess	Artic	5★
Yatzee	CP Software	3★
ZX Draughts	CP Software	4★
ZX Reversi	CP Software	4★

Utility

Allsort S-1	A Firminger	4★
Artist, The	Softek	5★
Art Studio	OCP	5★
Assembler	Artic	3★
Assembler	Roybot	2★
Beyond Basic	Sinclair	3★
Blast	Oxford Systems Co	5★
Building Price	J Redman	3★
Compiler	Softek	3★
Complete M Code Tutor	New Generation	4★
Composer	Contrast	1★
FP Compiler	Softek	5★
Games Designer	Quicksilva	4★
HURG	Melbourne House	4★
Illustrator	Gilsoft	5★
Keyword Extension	Timedata	4★
Lightmagic	New Generation	4★
Information Handling	McGraw Hill	2★
Make Music	Buffer Micro	4★
Melbourne Draw	Melbourne House	4★
Monitor/Diss.	Sinclair	4★
Music Maker	Bellflower	2★
Operation Caretaker	Global	3★
Paintbox	Print & Plotter	4★
Print Utilities	Sinclair	4★
Quill	Gilsoft	5★
Screen Machine	ISP	4★
Softalk 1-2	CP Software	4★
Spec. Compiler	Softek	4★
Spectre Mac/Mon	Oasis	4★
Spectrosim	Shiva	2★
Spectrum Extended Basic	CP Software	4★
Spectrum Monitor	Picturesque	4★
Spectrum Sprites	ISP	4★
Spectrum Super Toolkit	Nectarine	4★
Supercode II	CP Software	4★
Varitalk	ITS Software	3★
Vu3D	Sinclair	4★
White Lightning	Oasis	5★
Zeus Assembler	Sinclair	5★

QL

Adder Assembler	Adder Publishing	4★
Area Radar Controller	Shadowsoft	1★
Assembler Dev. Package	Metacomco	5★
Blackjack	Quest	1★
Cartridge Doctor	Talent	5★
EVA	Westway	2★
Expresso Coppee	Total computability	3★
GraphiQL	Talent	5★
GST Assembler	Sinclair Research	4★
Hopper	Microdeal	1★
Hyperdrive	English Software	3★
Land of Havoc	Microdeal	3★
MicroAPL	MicroAPL	5★
MonQL	HiSoft	4★
Pascal	Computer One	4★
Pascal	Metacomco	5★
QL Agenda	Q-Soft	1★
QL Bank Accounts System	KJ Gouldstone	2★
QL Cash Trader	Sinclair	5★
QL Caverns	Sinclair	3★
QL Chess	Psion	5★
QL Compiler	GST	3★
QL Gardener	Sinclair	2★
QL Match Point	Psion	5★
QL Monitor	Sinclair Research	4★
QL Reversi	Softschool	1★
QL Toolkit	Sinclair	5★
QSpell	Eidersoft	4★
Quilmerge	Pitch Associates	3★
Super Backgammon	Digital Precision	2★
SuperBasic Extensions	Hi Soft	4★
Super Sprite Generator	Digital Precision	3★
Touch 'n' Go	Sinclair Research	2★
Typing Tutor	Computer One	3★
Zkul	Talent	4★

A & F Software, Unit 8, Canalside Industrial Estate, Woodbine Street East, Rochdale, Lancashire OL16 5LB
Abacus Software, 21 Union Street, Ramsbottom, Nr Bury, Lancashire
Abbex, 20 Ashley Close, Manor Hall Drive, London NW4
Abersoft, 7 Maesfallen, Bow Street, Aberystwyth, Wales
Activision, 15 Harley House, Marylebone Road, London NW1
Adder Publishing Ltd, PO Box 148, Cambridge CB1 2EQ
Add-on Electronics, Units 2,3 & 4, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ
Addictive Games, 7a Richmond Hill, Bournemouth BH2 6HE
ADS, 8 Bronchurch Street, Portsmouth, Hampshire PO4 8RY
Adventure International, 85 New Summer Street, Birmingham B19 3TE
Alan Firminger, 171 Herne Hill, London SE24 9LR
Allanson Computing, 77 Chorley Road, Adlington, Chorley, Lancashire PR6 9LH
Alligata Software, 1 Orange Street, Sheffield S1 4DW
Argus Press Software, Liberty House, 222 Regent Street, London W1
Arcade Software, Technology House, 32 Chislehurst Road, Orpington, Kent BR6 0DG
Ariolasoft,Asphalt House, Suite 105-106, Palace Street, London SW1E
Arnold Wheaton, Parkside Lane, Dewsbury Road, Leeds LS11 5TD
Artic Computing, Main Street, Brandesburton, Driffield YO25 8RG
Astrocalc, 67 Peascroft Road, Hemel Hempstead, Herts HP3 8ER
Atlantis Software, 19 Prebend Street, London N1
Automata UK, PO Box 78, Southsea, Hampshire PO4 9SL
Axis, 71 Brookfield Avenue, Loughborough, Leicestershire LE11 3LN
Beau-Jolly, 19A New Broadway, Ealing, London W5
Bellflower Software, 6 Rosewood Avenue, Greenford, Middlesex UB6
Betasoft, 92 Oxford Road, Moseley, Birmingham B13 9SQ
Beyond Software, Lector Court, 151 Farringdon Road, London EC1
Bradway Software, 33 Conalan Avenue, Sheffield S17 4PG
Bridge Software, 36 Fernwood, Marple Bridge, Stockport, Cheshire
Bridgemaster, Sandymouth, Beeches Road, Farnham Common, Buckinghamshire SL2 3PS
Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX
Calpac Computer Software, 108 Hermitage Woods Crescent, St Johns, Woking, Surrey
Campbell Systems, 57 Trap's Hill, Loughton, Essex 1G10 1TD
CCS, 14 Langton Way, Blackheath, London SE3 7TL
CDS Micro Systems, Silver House, Silver Street, Doncaster, South Yorkshire DN1 1HL
Century Communications, Brookmount House, 62/65 Chandos Place, London WC2N 4NW
Century/Hutchinson, 17-21 Conway Street, London W1
Chalksoft, 17 Willowslea Road, Northwick, Worcester
Cheetahsoft, 24 Ray Street, London EC1R 3DJ
Clever Clogs, Liberty House, 222 Regent Street, London W1
Collins, 18/20 Stephenson Way, North Gower Street, London NW1 2DX
Collins Soft, 8 Grafton Street, London W1
Compusound, 32/33 Langley Close, Redditch, Worcester B98 0ET
Computatutor, 3 Thalia Close, Greenwich, London SE10 9NA
Computer One, 32 Science Park, Milton Road, Cambridge CB4 4DH
Contrast Software, Warren Road, Liss, Hampshire GU33 7DD
Cornhill Software, 2 Penrith Way, Aylesbury, Buckinghamshire HP21
CP Software, 10 Alexandra Road, Harrogate, Yorkshire HG1 5JS
Craig Communications, PO Box 46, Basingstoke, Hampshire
Creative Sparks, Thomson House, 296 Farnborough Road, Farnborough, Hampshire
CRL, 9 King's Yard, Carpenters Road, London E15 2HD
Cross Software, 72 Swanshope, Burney Drive, Loughton, Essex
CSP Systems, 213 Stainbeck Road, Leeds
DACC Ltd, 23 Waverley Road, Hindley, Wigan, Lancashire WN2 3BN
Database Publications, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY
Delta 4, The Shielding, New Road, Swanmore, Hampshire SO3 9PE
Design Design, 2 Ashton Way, East Herrington, Sunderland SR3 3RS
Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ
Digital Precision, 91 Manor Road, Higham Hill, London E17
DK'tronics, Unit 6, Shire Hill Ind Est, Saffron Walden, Essex CB11
Domark, 204 Worple Road, London SW20
Dorcas Software, 3 The Oasis, Glenfield, Leicester
Dunitz, 154 Camden High Street, London NW1 0NE
Durrell Software, Castle Lodge, Castle Green, Taunton TA1 4AB
Dymond Software, 22 Hospital Road, Annan, Dumfriesshire DG12
Dynavision Production Studio, PO Box 96, Luton LU3 2JP
East London Robotics, St Nicholas House, The Mount, Guildford, Surrey GU2 5HN
Eastmead, Eastmead House, Lion Way, Camberley, Surrey GU16 5EZ
Eidersoft, The Office, Hall Farm, North Ockenden, Upminster, Essex RM14 3QH
8th Day, 18 Flaxhill, Moreton, Wirral, Merseyside LU6 7UH
Electric Abacus, Oaklands House, Solartron Road, Farnborough, Hants
Elite Systems, Anchor House, Anchor Road, Aldridge, Walsall, West Midlands WS9 8PW
Elm Computers, 59 Bateman Road, East Leake, Loughborough, Leicestershire LE12 6NN
Englefield Software, High House, Mill Street, Buxton, Norfolk NR10
English Software, 1 North Parade, Parsonage Gardens, Manchester
Fantasy Software, Fauconberg Lodge, 27a St Georges Road, Cheltenham, Gloucestershire
Fawkes Computing, 41 Wolfridge Ride, Alveston, Bristol BS12 2RA
Felix Software, 19 Leighton Avenue, Pinner HA5 3BW
Firebird Software, Wellington House, St Martins Lane, London WC2
Fisher Software, 47 London Road, Buxton, Derbyshire
Five Ways Software Ltd, 64 Kidderminster Road, Bromsgrove, Worcester B61 7JY
Fulwood, 20 Templestowe Hill, Whitkirk, Leeds LS15 7EJ
Games Machine, 40 Fretherne Road, Welwyn Garden City, Hertfordshire AL8 6NU
Gamma Software, 12 Milverton Road, London NW6 7AS
Gargoyle Games, 74 King Street, Dudley, West Midlands
Gavin Barker, 12 Fleming Field, Shotton Colliery, County Durham DH6 2JF
GCE Tutoring, 40 Brinners Hill, Widner End, High Wycombe, Buckinghamshire
Gemini Marketing, Unit 21, Dinan Way Trading Estate, Exmouth, Devon EX8 4RS
Gemtime Software, 16 Ben Ledi Road, Kirkcaldy, Fife KY2 5RP
Genesis Productions, 30 Great Portland Street, London W1N 5AD
Gilsoft, 30 Hawthorn Road, Barry, South Glamorgan, South Wales
Global Software, 33 Shelgate Road, London SW11 1BA
Gouldstone, 45 Burleigh Avenue, Wallington, Surrey SM6 7UG
Granada Publishing, 8 Grafton Street, London W1X 3LA
Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS
Griffin & George, Frederick Street, Birmingham B1 3HT
GST, 91 High Street, Longstanton, Cambridge CB4 5BS
Haresoft, PO Box 365, London NW1
Harlequin Software, 43 Osprey Park, Thornbury, Bristol BS12 1LY
Hartland Software, 32 Ivor Place, London NW1 6DA
Heinemann Computer Education, 22 Bedford Square, London WC1B
Hessel, 15 Lythan Court, Cadwell Crescent, Sunningdale, Berkshire
Hestacrest, PO Box 19, Leighton Buzzard, Bedfordshire LU7 0DG
Hewson Consultants, 56B Milton Trading Estate, Milton, Abingdon
Hilderbay, 8/10 Parkway, Regents Park, London NW1 7AA
Hilton Computer Services, 14 Avalon Road, Orpington, Kent
Hisoft, 180 High Street, Dunstable, Bedfordshire LU6 1AT
Hodder & Stoughton, PO Box 6, Dunton Green, Sevenoaks, Kent
Homestudy Ltd, Treleigh Woods Farm, Treleigh, Redruth, Cornwall TR16 4AW
Hornby Software, 21 Penfold Hill, Leeds LS15 0PW
Icon Software, 65 High Street, Gosforth, Tyne and Wear NE3 4AA
IMS Software, 143/145 Uxbridge Road, Ealing, London W13 9AV
Image Systems, 34 Lynwood Drive, Worcester Park, Surrey KT4 7AB
Imagine (84), 6 Central Street, Manchester M2 5NS
Impact Software, 2 New Street, Cullompton, Devon EX15 1HA
Imperial Software, Imperial House, 153 Churchill Road, Poole, Dorset
Incentive, 54 London Street, Reading, Berkshire RG1 4SQ
Inform Software, 3 Treesdale Close, Birkdale, Southport PR8 2EL
Interceptor Micros, Lindon House, The Green, Tadley, Hampshire
Interceptor Software (see Interceptor Micros)
Interstella Software, 82 New Forest Drive, Brockenhurst, Kent
ITS Software, 33 Foscote Road, London NW4 3SE
KJ Gouldstone, 45 Burleigh Avenue, Wallington, Surrey SM6 7JG
JK Greye Software, 16 Park Street, Bath, Avon BA1 2TE
J Redman, Stevelon House, Slade Lane, Tarnock, Axbridge, Somerset
JRS Software, 19 Wayside Avenue, Worthing, Sussex BN13 3JH
Kemp, 43 Muswell Hill, London N10 3PN
Keysoft, 6 Bruce Grove, Tottenham, London N17
Kosmos Software, 1 Pilgrims Close, Harlington, Dunstable, Bedfordshire LU5 6LX
Kuma Computers, 12 Horseshoe Park, Pangbourne, Berkshire RG8
Learning Systems, 11 Warwick Court, Princes Drive, Harrow, Middx
Legend, PO Box 435, London E4 7LX
Leisure Genius, 3 Montague Row, London W1H 1AB
Lerm, 10 Brunswick Gardens, Corby, Northamptonshire
Level Nine, 229 Hugenden Road, High Wycombe, Buckinghamshire
Llainlan Software, Pontyberem, Llanelli, Dyfed, Wales

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Software Publishers

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Llamasoft, 49 Mount Pleasant, Tadley, Hampshire
Longman, Longman Group, Longman House, Harlow, Essex CM20
Lothlorien, 56a Park Lane, Poynton, Stockport, Cheshire SK12 1RE
Macmillan Software, 4 Little Essex Street, London WC2R 3LF
Manor Software, 24 Manor Gardens, London SW20
Manx Tapes, Garey Veg, Glen Audlyn, Ramsey, Isle of Man
Martech Games, 9 Billingburgh Road, Eastbourne, East Sussex BN20
Mastertronic, (as for Mastervision)
Mastervision, Park Lorne, 111 Park Road, London NW8 7JL
McGraw Hill, Shoppen Hangers Road, Maidenhead, Berkshire
Medidata, PO Box 26, London NW9 9BW
Melbourne House, Castle Yard House, Castle Yard, Richmond TW10
Metacomco, 26 Portland Square, Bristol BS2 8RZ
Michael Slatford, 3 Campden Road, South Croydon, Surrey CR2 7EQ
Microdeal Ltd, 41 Truro Road, St Austell, Cornwall PL25 5JE
Micro Dealer UK, Unit 6 Marlborough Road Trading Estate, Lattimore Road, St Albans, Hertfordshire
Micro Wish, PO Box 15, Colne, Lancashire BB8 9DB
MicroAPL, Unit 1F, Nine Elms Industrial Estate, 87 Kirtling Street, London SW8 5BP
Microbyte, 19 Worcester Close, Lichfield, Staffordshire
Microcosm, 68 The Glade, Clayhall, Ilford
Microdeal, 41 Truro Road, St Austell, Cornwall PL25 5JE
Micromania, 14 Lower Hill Road, Epsom, Surrey KT19 8LT
Micromega, 230/236 Lavender Hill, London SW11
Microsphere, 72 Rosebery Road, London N10 2LA
Mikro-Gen, 44 The Broadway, Bracknell, Berkshire RG12 1AG
Millenium Software, 17 Whitehouse Drive, Kingstone, near Hereford
Minatron Computing, 34 Pinewood Close, Westbury-on-Trym, Bristol
Mind Games, Liberty House, 222 Regent Street, London W1
Mirrorsoft, PO Box 50, Bromley, Kent BR2 9TT
Monitor Software, Suite 11, 526-8 Watford Way, London NW7
Mosaic, 187 Upper Street, London N1 1RQ
MW Gamesworld, 12 Lawnswood Avenue, Chasetown, Walsall WS7
Myrmidon Software, PO Box 2, Tadworth, Surrey, KT20 7LU
Naigram Software, c/o Soho Synth House, 18A Soho Square, London
Nectarine, 837 Yeovil Road, Slough SL1 4JH
New Generation Software, FREEPOST, Bath BA2 4TD
Newsoft, 12 White Broom Road, Hemel Hempstead, Hertfordshire
Oasis Software, 12 Walliscote Road, Weston-Super-Mare, Avon
Ocean Software, 6 Central Street, Manchester M2 5NS
OCP, 77a Packhorse Road, Gerrards Cross, Buckinghamshire SL9 8PQ
Odin Software, The Podium, Steers House, Canning Place, Liverpool
Orpheus Ltd, Unit 1, Church Farm, Hatley St George, Near Sandy, Bedfordshire SG19 3HP
Orwin Software, 26 Brownlow Road, Willesden, London NW10 9QL
Palace Software, The Scala, 2nd Floor, 275 Pentonville Road, London
PD Visual Marketing, Thanet House, Craven Road, London W2
Penguin, 536 King's Road, London SW10
Phipps Associates, 172 Kingston Road, Ewell, Surrey
Phoenix Publishing, 14 Vernon Road, Bushey, Hertfordshire WD2 2JL
Picturesque, 6 Corkscrew Hill, West Wickham, Kent BR4 9BB
Pitch Associates, 39 Rockleigh Avenue, Leigh-on-Sea, Essex
Pooter Games, 24 Parsloes Avenue, Dagenham RM9 5NX
Poppysoft, The Close, Common Road, Headley, Newbury, Berkshire
Positive Image Software, 129 Dumbarton Road, Glasgow
Print 'n' Plotter Products, 19 Borough High Street, London SE1 9SE
Protek Computing, 1a Young Square, Brucefield Ind Park, Livingston, West Lothian
Psion, 2 Huntsworth Mews, Gloucester Place, London NW1
PSS, 452 Stoney Stanton Road, Coventry CV6 JDG
Pulsonic, Warwick Distribution Ltd, 3 Standard Road, Park Royal, London NW10 6EX
Q-Soft, PO Box 90, Barnet, Hertfordshire EN5 5RN
Quest International Computer Systems, Gillingham House, 38-44 Gillingham Street, London SW1
Quicksilva, Liberty House, 222 Regent Street, London W1
Radar Games, 53 Flavel Street, Woodsetton, Dudley DY1 4NU
RAM Writer, 3 Vumba House, 2 Cedar Gardens, Sutton, Surrey
Ramtop Services, 5 Rue D'Artois, 75008, Paris, France
Realtime Software, Prospect House, 32 Sovereign Street, Leeds LS1
Red Shift, 12c Manor Road, Stoke Newington, London N16 5SA
Richardson Institute for Conflict and Peace Research, Dept of Politics, University of Lancaster LA1 4YF
Romantic Robot, 77 Dyne Road, London NW6 7DS
Rose Software, 148 Widney Lane, Solihull, West Midlands
Runesoft, Charnwood House, Crossgate Drive, Nottingham NG2 TLW
Sentient Software, Branch House, 18 Branch Road, Armley, Leeds
Scisoft, 5 Minister Gardens, Newthorpe, Eastwood, Nottingham NE16
SCR Adventures, 190 Shelbourne Road, Tottenham, London
SD Microsystems, PO Box 24, Hitchin, Hertfordshire SG4 0AE
Selec Software, 37 Councillor Lane, Cheadle, Cheshire
Serim Software, Freepost, Dept SU7, PO Box 163, Slough, Berkshire
Shadowsoft, 70 Gooseacre, Cheddington, Bedfordshire
Shards, Suite G, Roycraft House, 15 Linton Road, Barking, Essex
Shepherd Software, Elm House, 23-25 Elmshott Lane, Chippenham, Slough, Berkshire
Silversoft, London House, 271/273 King Street, London W6 9LZ
Sinclair Research, 25 Willis Road, Cambridge CB1 2AQ
666, PO Box 190, Maidenhead, SL6 1YX
Slogger Software, 215 Beacon Road, Chatham, Kent
Softschool, 471 Hornsey Road, London N19 3QL
Soft Tech, 31 Lampits, Hoddesdon, Hertfordshire
Softek International Ltd, 12/13 Henrietta Street, London WC2E 8LH
Softel, 5 Durward Drive, Glenrothes, Fife KY6 2LB
Softly Softly, 36 Broadlands Road, Bromley, Kent
Software Cottage, 19 Westfield Drive, Loughborough, Leicestershire LE11 3QJ
Software Farm, 3rd Floor, 16 Charlotte Street, London W1
Software Projects, Bear Brand Complex, Allerton Road, Woolton, Liverpool, Merseyside L25 7SE
Spartan CC, 29 Feltham Avenue, East Moseley, Surrey KT8 9BJ
Spectadraw, I Cowleaze, Chinnor, Oxfordshire OX9 4TD
Spectrasoft, Capital House, Market Place, London W3 6AL
Spoof Software, 58 Railway Road, Urmston, Manchester M31 1XT
St Bride's, Burtonport, County Donegal, Ireland
Star Dreams, 17 Barn Close, Seaford, East Sussex, BN25 3EN
Startersoft, 32 Parkfields, Chippenham, Wiltshire
Statesoft, 29 Burrowfield, Welwyn Garden City, Hertfordshire
Stell Software, 36 Limefield Avenue, Whalley, Lancashire BB6 9RJ
Sterling Software, Garfield House, 86/88 Edgeware Road, London, W2
Stratagem Cybernetics, 286 Corbin Place, 2E, Brooklyn, New York 11235
Sulis Software, 4 Church Street, Abbey Green, Bath BA1 1FP
Sunshine Books, 12/13 Newport Street, London WC2
Sussex Publication, Townsend Poulshot, Devizes, Wiltshire SN10 1SD
System 3, South Bank House, Black Prince Road, London SE11
Talent Computer Systems Curran Building, 101 St James Road, Glasgow G4 0NS
Taskset, 13 High Street, Bridlington, Yorkshire YO16 4PR
Tasman Software, 17 Hartley Crescent, Leeds LS6 2LL
Temptation Software, 27 Cinque Ports Street, Rye, East Sussex
Terminal Software, Derby House, Derby Street, Bury BL9 0NW
Texgate, 14 Brook Lane, Corfe Mullen, Wimbourne, Dorset
The Edge, 31 Maiden Lane, Covent Garden, London, WC2E 8LH
Think Tank, 35 Wellington Road, Wimbledon Park, London SW19
Thor Computer Software, Erskine Industrial Estate, Liverpool L6 1AP
Timedata, 16 Hemmells High Road, Laindon, Basildon, Essex SS15
Total Computability, 45 Ewart Street, Brighton BN2 2UP
Transform, 41 Keats House, Porchester Mead, Beckenham, Kent
Tutorial Software, 'Vilands', Glasllwch Lane, Newport, Gwent NP1
Ultimate Play the Game, The Green, Ashby de la Zouch, Leicestershire
Unicorn Micro Systems, 312 Charminster Road, Bournemouth BH8
University Software, 29 St Peters Street, London N1
US Gold, Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY
Vega Space Systems, 28 Watford Road, St Albans AL1 2AJ
Virgin Games, 2-4 Vernon Yard, London W11
V0², 9-10A The Bridge, Walsall, West Midlands
Vortex software, Vortex House, 24 Kansas Avenue, off South Langworthy Road, Salford, M5 2GL
Westway, 24 Preston Road, Lytham, Lancashire FY8 5AA
Widget Software, 48 Durham Road, London N2 9DT
Winters, 24 Swannington Close, Cantley, Doncaster, South Yorkshire
Woosoft, 5 Andrews Close, Robertsbridge, Sussex TN32 5PB
Workforce, 140 Wilsden Avenue, Luton, Bedfordshire
Wyvern Software, 2 Princes Building, George Street, Bath BA1 2ED

ZXWORD SOLUTION

Across

3. SPACE
8. RAMTOP
9. Nimbus
10. Set
11. Magazine
13. Items
14. Addend
15. Con-man
18. Rooks
22. Source
24. Window
27. Bruno
28. Graceful
30. Men
31. Border
32. Origin
33. Sit-in

Down

1. Caps Lock
2. Station
3. Space bar
4. Atoms
5. Enigma
6. Amazed
7. Turn
12. Eddy
16. Not
17. MKS
19. Solution
20. Semantic
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All the fun of the fair

GREMLIN prefers dark corners for the accumulation of hot gossip, but you have to put up with what you can get. Lurching through the sweltering PCW show Gremlin turned up the odd nugget, nevertheless.



ORGANISERS of the PCW show attempt to prevent Mark Cale of System 3 from removing all his clothes in a desperate attempt to publicise Twister, Mother of Harlots. The game has nothing to do with sex, but that's show-biz . . .

Son of Banderbotch

Didn't the **Sinclair** stand look rough next to all those gleaming Atari STs? Gremlin was particularly amused to note the presence of **Meteor Storm** as the latest dynamic software for the QL. Slugger was presumably less amused to note the presence of **Dave Lawson** and **Ian Hetherington** on the Atari stand. Those two Mersey slickers were showing off a game called **Brataccas** — none other than the ill-fated **Bandersnatch**.

Slugger's mob always thought the game was their's. So what happened? Sinclair spokesmen claim ignorance of the whole business. Mind you, we only saw four screens of the megagame. "It's more than my life's worth to leave the disc in the machine," says young **Eugene** 'deprived' **Evans** of Psygnosis. Well, that's his story . . .

Tit for tat

Some companies didn't even manage an unfinished version of their games. **Mark Cale** of **System 3** still hadn't got **International Karate** ready after the supposed break-in at his offices. Instead, he mounted a tacky dance show which was deemed so vulgar the organisers pulled the plug.

The emotional and distressed Cale was even more upset to discover **Andy** 'Cartier' **Shafte** walking out on him in the middle of the crisis to join some distributing outfit. Andy's already been on the phone to Gremlin with the 'truth' about System 3. Our lawyers are sifting through the transcripts to see what, if anything, can be published.

Assuming anyone really wants to know . . .

Godfather Part VII

There's bigger fish to fry, though. Gremlin bumped into **David Ward** practising his golf swing on the edge of the **US Gold** stand. The Brian Epstein of British software claims **Rambo**, Ocean's latest spin-off, does exist even if we couldn't see a single screen shot on the stand. Gremlin understands there is indeed a basement somewhere at Ocean with a title-screen of the C64 version, or some such.

Ward also breaks silence on the muddled question of who owns Ocean. "We are in fact owned by the Mafia," says Ward, "but run by nominees for tax purposes. Now I've got to dash for a plane — I'm playing golf in Florida in a few hours . . ."

Mental arithmetic

Meanwhile Ward is also bringing out a compilation tape called **They Sold a Million**. Gremlin isn't aware of any game which has ever sold a million — the record for outrageous sales figures so far stands at Activision's 300,000 for **Ghostbusters**.

Unabashed, the Jack Nicklaus of Manchester explains that it's the four games **together** which sold a million. Well, maybe not quite a million. Certainly closer to a million than to half a million.

"The figure," says Ward, confidently, "is no more than 250,000 out."

Would you buy an Afghan Coat off this man . . .?

Grounds for divorce

Brazen Backslappers of the Month Award goes to **Century/Hutchinson** for a tremendous piece of hype about **The Fourth Protocol**.

"Christmas presents for the man in your life," rants the sexist copywriter, "of any age, be he husband, lover, brother or son." It then goes on to talk about ignoring socks and cigars and demanding **The Fourth Protocol** instead.

With tales of computer widows rife throughout the land, Gremlin would have thought any man getting a computer game from his nearest and dearest this Christmas might have cause to be worried. What personal habits of his are so obnoxious that his family prefers to have him locked away in the bedroom fiddling with his icons all day long . . .?

Beanz meanz . . .

Sharp-eyed telly users may have spotted a recent ad for **Heinz** beans, in which a youthful bean-eater was observed reading — or more likely trying to find his way around — a copy of *Your Computer*.

Gremlin was wondering what *Your Computer* did to get such favoured status. All is revealed with the October issue of the half-baked rag, which has a vast stack of baked bean tins on the cover. Is this a subtle example of back-scratching, or does it confirm what you already knew — that *Your Computer* is full of wind . . .?

Calling Cambridge

If you're absolutely bored sick of stories and speculation about the **Derby, Sinclair's** main runner in the 128K Barcelona Stakes, try this for size — the £99.95 Cellular Telephone.

Gremlin, true to what few ethics he has left, refuses to reveal the source for this piece of speculation. On the other hand, it did come from the character who tipped off Incorruptible Scolding about the Spanish Derby, so you never know . . .



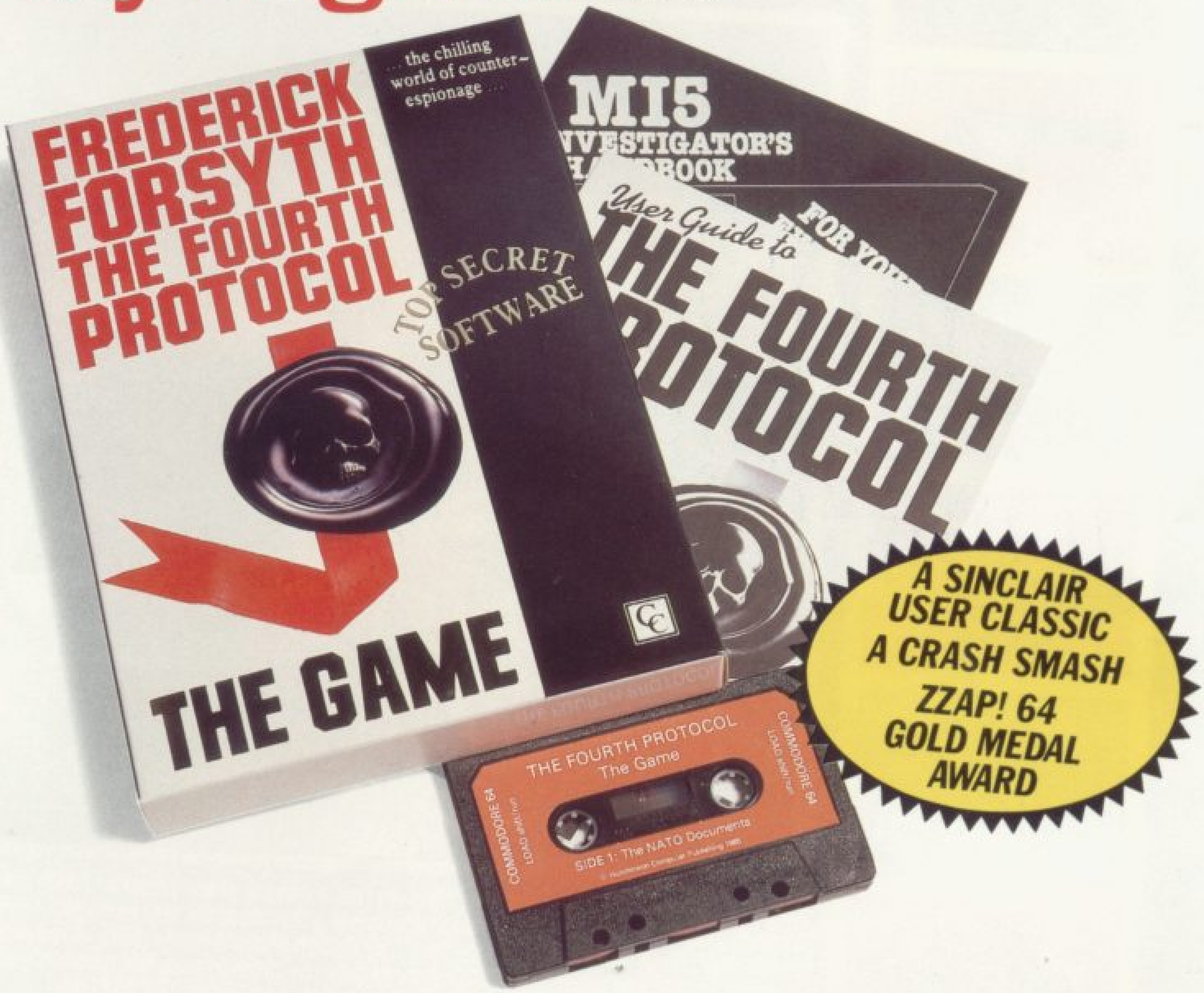
MARK STRACHAN and Dominic Wheatley of Domark manage a sickly grin as they hand over a fat cheque to the winner of Eureka! Dominic fell off his chair when he heard someone had won, which is probably why his signature looks so faint.

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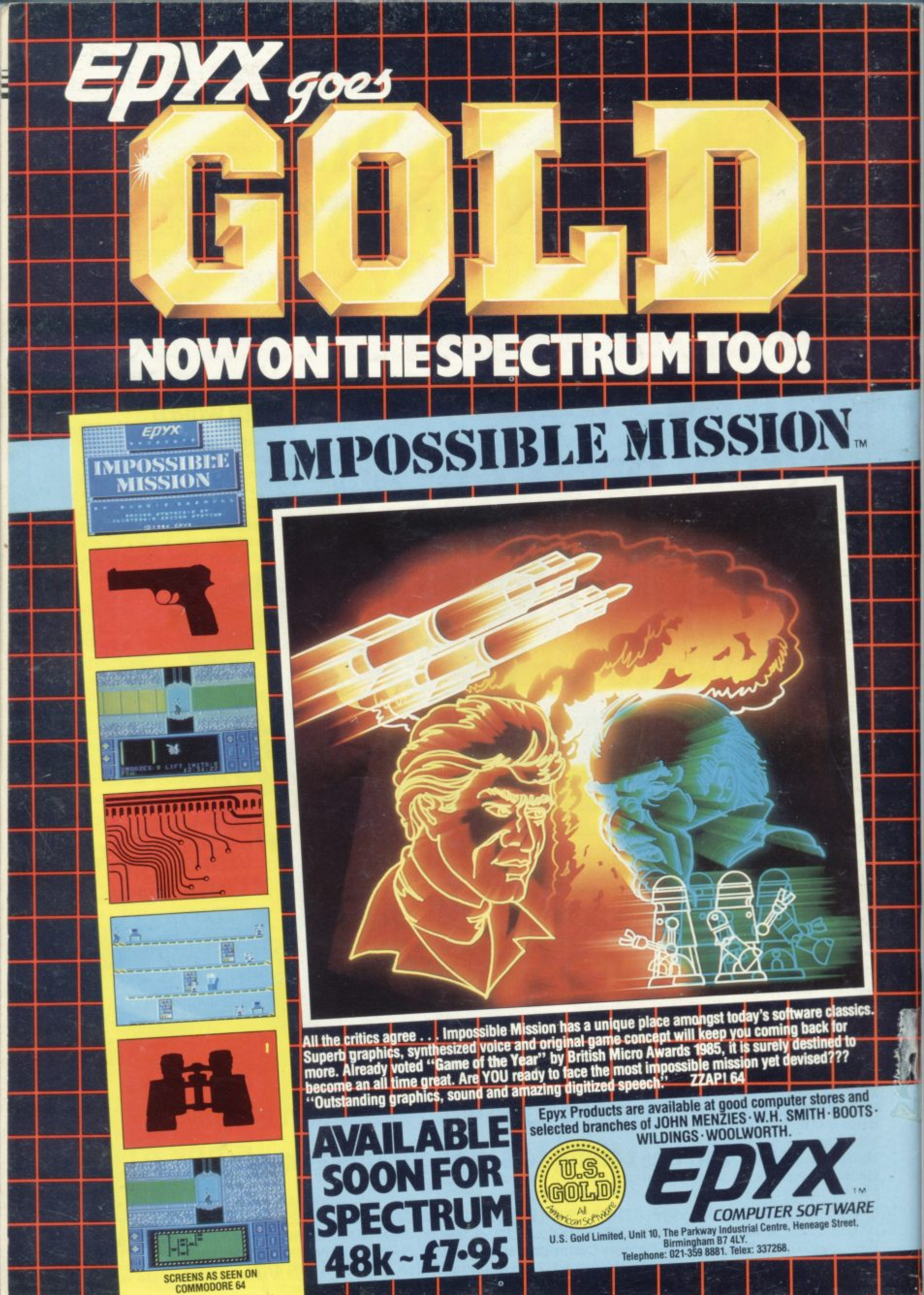
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